

Model of No. 2086

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, *Editor.*

ASSISTANT EDITORS:

JAMES T. HODGE, *For Mining and Metallurgy.*

CHARLES T. JAMES, *For Manufactures and the Mechanic Arts.*

M. BUTT HEWSON, *For Civil Engineering.*

SATURDAY, AUGUST 31, 1850.

Second Quarto Series, Vol. VI., No. 35.---Whole No. 750, Vol. XXIII.

ESTABLISHED IN 1831.

NEW-YORK:

PUBLISHED WEEKLY, BY

JOHN H. SCHULTZ & CO.

Room 12, Third Floor,

No. 136 Nassau Street.

AMERICAN
RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ASSISTANT EDITORS:
JAMES T. HODGE, for Mining and Metallurgy
CHARLES T. JAMES, for Manufactures and the Mechanical Arts
H. BUTT BENSON, for Civil Engineering

SATURDAY, AUGUST 21, 1880.

Second Quarter Review, Vol. VII, No. 32.—Whole No. 750, Vol. XXIII.

ESTABLISHED IN 1841.

NEW YORK
PUBLISHED WEEKLY BY
JOHN H. SCHULTE & CO.
No. 130 NASSAU STREET.
Room 12, Third Floor.

IRON BRIDGES, BRIDGE & ROOF BOLTS.
 etc. STARKS & PRUYN, of Albany, New York, having at great expense established a manufacturing with every facility of Machinery for Manufacturing Iron Bridges, Bridge and Roof Bolts, together with all kinds of the larger sizes of Screw Bolts, Iron Railings, Steam Boilers, and every description of Wrought Iron Work, are prepared to furnish to order, on the shortest notice, any of the above branches, of the very best of American Refined Iron, and at the lowest rates.

During the past year, S. & P. have furnished several Iron Bridges for the Erie Canal, Albany Basin, etc. and a large amount of Railroad Bridge Bolts, all of which have given the most perfect satisfaction.

They are permitted to refer to the following gentlemen:

Charles Cook,	} Canal Commissioners of the State of New York.
Nelson J. Beach,	
Jacob Hinds,	} Engineer of the Bridges for the Albany Basin.
Willard Smith, Esq.,	
Messrs. Stone & Harris,	} Railroad Bridge Builders, Springfield, Mass.
Mr. Wm. Howe,	
Mr. S. Whipple,	} Engineer & Bridge Builder, Utica, N. Y.

January 1, 1849.

TO RAILROAD COMPANIES AND BUILDERS OF MARINE AND LOCOMOTIVE ENGINES AND BOILERS.

PASCAL IRON WORKS.

WELDED WROUGHT IRON TUBES

From 4 inches to 1 in calibre and 2 to 12 feet long, capable of sustaining pressure from 400 to 2500 lbs per square inch, with Stop Cocks, T, U, and other fixtures to suit, fitting together, with screw joints, suitable for STEAM, WATER, GAS, and for LOCOMOTIVE and other STEAM BOILER PLUM.



Manufactured and for sale by
MORRIS, TASKER & MORRIS,
 Warehouse E. E. Corner of Third & Walnut Streets,
PHILADELPHIA.

To Railroad Companies, etc.



The undersigned has at last succeeded in constructing and securing by letters patent, a Spring Pad-lock which is secure, and cannot be knocked open with a stick, like other spring locks, and therefore particularly useful for locking Cars, and Switches, etc.

Companies that are in want of a good Pad-lock, can have open samples sent them that they may examine and judge for themselves, by sending their address to
C. LIEBRICH,
 46 South 8th St., Philadelphia.

November 3, 1849.

Mattewan Machine Works.

THE Mattewan Company have added to their Machine Works an extensive LOCOMOTIVE ENGINE department, and are prepared to execute orders for Locomotive Engines of every size and pattern—also Tenders, Wheels, Axles, and other railroad machinery, to which they ask the attention of those who wish such articles, before they purchase elsewhere.

STATIONARY ENGINES, BOILERS, ETC.
 Of any required size or pattern, arranged for driving Cotton, Woollen, or other Mills, can be had on favorable terms, and at short notice.

COTTON AND WOOLLEN MACHINERY,
 Of every description, embodying all the modern improvements, second in quality to none in this or any other country, made to order.

MILL GEARING,

Of every description, may be had at short notice, as this company has probably the most extensive assortment of patterns in this line, in any section of the country, and are constantly adding to them.

TOOLS.

Turning Lathes, Slabbing, Planing, Cutting and Drilling Machines, of the most approved patterns, together with all other tools required in machine shops, may be had at the Mattewan Company's Shops, Fishkill Landing, or at 66 Beaver street, New York.

WM. B. LEONARD, Agent.

RAILROAD

India-rubber Springs.

If any Railroad Company or other party desires it, the NEW ENGLAND CAR COMPANY will furnish India-rubber Car Springs made in the form of washers, with metallic plates interposed between the layers, or in any other form in which they can be made; in all cases guaranteeing the right to use the same against any and all other pretended rights or claims whatsoever.

F. M. Ray, 93 Broadway, New York.
 E. CRANE, 99 State Street, Boston.
 1849.

MACHINE WORKS OF ROGERS KETCHUM & GROSVENOR, Patterson, N. J. The undersigned receive orders for the following articles manufactured by them of the most superior description in every particular. Their works being extensive, and the number of hands employed being large, they are enabled to execute both large and small orders with promptness and dispatch.

Railroad Work.—Locomotive Steam Engines and Tenders; Driving and other Locomotive Wheels, Axles Springs and Flange Tires; Car Wheels of Cast Iron a variety of patterns and chills; Car Wheels of Cast Iron with wrought tires; Axles of best American refined iron; springs; boxes and bolts for cars.

Cotton, Wool and Flax Machinery of all descriptions and of the most improved patterns, style and workmanship.

Mill gearing and millwright work generally, hydraulic and other presses; press screws; callenders; lathes and tools of all kinds; iron and brass castings of all descriptions.

ROGERS, KETCHUM & GROSVENOR,
 Patterson, N. J. or 74 Broadway, New York.

THE NEWCASTLE MANUFACTURING CO. continue to furnish at the Works, situated in the town of Newcastle, Del., Locomotive and other steam engines, Jack Screws, Wrought Iron Work and Brass and Iron Castings, of all kinds connected with Steamboats, Railroads, etc.; Mill Gearing of every description; Cast Wheels (chilled) of any pattern and size, with Axles fitted, also with wrought tires, Springs, Boxes and bolts for Cars; Driving and other wheels for Locomotives.

The works being on an extensive scale, all orders will be executed with promptness and despatch. Communications addressed to Mr. William H. Dobbs, Superintendent, will meet with immediate attention.

ANDREW C. GRAY,
 President of the Newcastle Manuf. Co.

DEAN, PACKARD & MILLS,

MANUFACTURERS OF ALL KINDS OF

RAILROAD CARS,

SUCH AS

PASSENGER, FREIGHT AND CRANK CARS

— ALSO —

SNOW PLOUGHS AND ENGINE TENDERS

OF VARIOUS KINDS.

CAR WHEELS and AXLES fitted and furnished at short notice; also, **STEEL SPRINGS**

of various kinds; and

SHAFTING FOR FACTORIES.

☞ The above may be had at order at our Car Factory

REUEL DEAN,
ELIJAH PACKARD,
ISAAC MILLS,
SPRINGFIELD, MASS.
 1748

Iron Safes.

FIRE and Thief-proof Iron Safes, for Merchants, Banks and Jewelers use. The subscriber manufactures and has constantly on hand, a large assortment of Iron Safes, of the most approved construction, which he offers at much lower rates than any other manufacturer.



These Safes are made of the strongest materials, in the best manner, and warranted entirely fire-proof and free from dampness. Western merchants and the public generally are invited to call and examine them at the store of E. Corning & Co., sole agents, John Townsend, Esq., or at the manufactory.

Each safe furnished with a thief-detector lock, of the best construction.

Other makers' Safes repaired, and new Keys and Locks furnished at the shortest notice.

H. W. COVERT
 cor. Steuben and Water sts. Albany

August 24, 1848.

PHILADELPHIA CAR MANUFACTORY,

CORNER SCHUYLKILL 2d and HAMILTON STS.,
 SPRING GARDEN, PHILADELPHIA CO., PA.

Kimball & Gorton,

Having recently constructed the above works, are prepared to construct at short notice all kinds of

RAILROAD CARS, viz:

Passenger Cars of all classes—Open and Covered Freight and Express Cars—Coal Cars—Hand Cars & Trucks of all descriptions.

They are also prepared to furnish Chilled Wheels of any pattern. Car Wheels & Axles fitted and furnished. Snow Ploughs and Tenders made to order. Steel and other Springs always on hand.

All orders will be filled at short notice, and upon as good terms as at any other establishment in the country. On all business from the Exchange run within one square of the manufactory every 10 minutes during the day.
 Philadelphia, June 16, 1849.

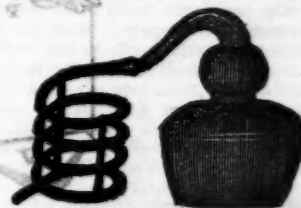
Patent Self-clinching Railroad Spikes.



These spikes have been in use upon various roads for several years, and have met with universal approval by Engineers. They drive in the manner shown, turning themselves, and are therefore not liable to work loose. They will prove of great value to secure the chair.

We are also manufacturing railroad spikes, hook and flat head; wrought chairs, clamps, etc., of superior quality, and are prepared to contract for any pattern or weight upon favorable terms.

SMITH & TYSON,
 25 South Charles st., Baltimore Md.



P. H. Griffin,

Corner of Steuben and James Sts. Albany, N.Y.

CONTINUES to manufacture copper flues for locomotive boilers, brewers' coppers, stills, tanner heaters, etc. Copper work in general, at the shortest notice. He has constantly on hand brass cocks, brass valves, copper pumps of every variety. Orders promptly attended to.

Patent India Rubber Steam Packing.

THIS article, made by the subscriber, who alone is authorized to make it, is warranted to stand as high a degree of heat as any that has been or can be made by any person—and is the article which has made the reputation of India Rubber Steam Packing and the demand therefor. A large assortment of all thicknesses requisite for any description of engines, steam pipes, valves, etc., constantly on hand and for sale by the manufacturer and patentee, who will give every information regarding its properties, mode of use, etc., at the warehouse.

JOHN GREACHEN, JR.,
 98 Broadway, opposite Trinity Church.
 New York, October, 1849.

Fire Brick.

THE Subscribers have constantly on hand Rifford's Stourbridge, Oak Farms Stourbridge, Lister, Worley, Red and White Welsh Fire Bricks, common and fancy shapes. Also,

ROOFING SLATES,

from the best Welch quarries, and of all sizes. Also

COAL.

of all kinds—Liverpool Orrell and Channel, Scotch, New Castle, Pictou, Sidney, Cumberland, Virginia, and all kinds of Anthracite coals. Also,

Pig Iron, Salt, etc., etc., for sale at the lowest market price. Apply to

SAMUEL THOMPSON & NEPHEW,
 275 Pearl and 43 Gold Sts., New York.

November, 23, 1849.



NEW YORK IRON BRIDGE COMPANY.

The Bridges manufactured by this Company having been fully tested on different Railroads, by constant use for more than two years, and found to answer the full expectations of their most sanguine friends, are offered to the public with the utmost confidence as to their great utility over any other Bridge now known. The plan of this Bridge is to use the iron so as to obtain its greatest longitudinal strength, and at the same time it is so arranged as to secure the combined principles of the Arch, Suspension and Triangle, all under such controlling power as causes each to act in the most perfect and secure manner, and at the same time impart its greatest strength to the whole work.

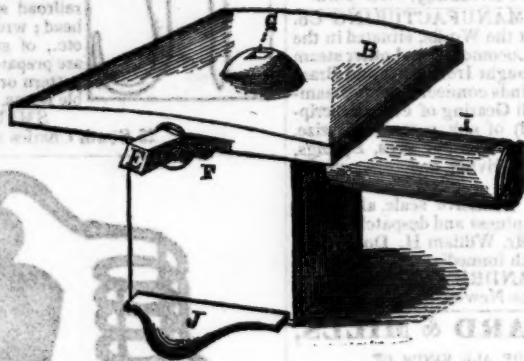
The NEW YORK IRON BRIDGE COMPANY are prepared to furnish large quantities of Iron Bridging for Railroad or other purposes, at short notice, and at moderate prices.

Models, and pamphlets giving full descriptions of the above Bridge, with certificates based on actual trial from undoubted sources, will be found at the office of the Company, 39 Jauncey Court, Wall st., or of W. RIDER & BROTHMAN, 19 Nassau Street, where terms of contract will be made known, and where orders are solicited.

August 29, 1849.

M. M. WHITE,
Agent for the Company.

E. Harris' Patent Rotary Blacksmith Tuyere.



LETTERS Patent were issued January 9, 1849, to E. HARRIS, of Springfield, for an Improved Rotary Blacksmith Tuyere. Since that time there have been some hundreds put in operation, giving satisfaction and full proof of superiority over all others.

This Tuyere is so arranged that by one movement it can be changed from the largest work to the smallest; at the same time the fire is changed in proportion, thereby making a great saving in coal. Words cannot convey the full merits of this Tuyere; nor is it deemed necessary to speak in disparagement of other Tuyeres, as every smith is capable of judging for himself, and will give merit where merit is due.

I will simply say that there has not been a single instance where I have had my Tuyere put in use but it has given full satisfaction, and is recommended by all who have used them, as being superior to any other ever introduced. I would invite all to give them a trial; and the names of those using them being given, I hope it may induce others to try; they then recommend themselves.

Western Railroad Shop, Springfield, Mass.

" " Pittsfield, " "

Connecticut val. " Springfield " "

" " N. Hampton " "

Hartford " Hartford, Conn.

New Haven " New Haven " "

Norwich and Worcester, Norwich " "

N. York and N. Haven, New Haven " "

Saratoga and Whitehall, Saratoga, N. Y.

Vermont Central, " " "

Hudson and Berkshire, Hudson, " "

L. Kingsley, Canton, Mass.

Hadley Falls Co. Ireland, W. Springfield, Mass.

Sidney Patch, Boston, " "

Ames Manuf. Cor., Chickopee, " "

American Machine w'ks, Springfield " "

Dean, Packard & Mills " "

G. Frank Bradley, N. Haven, Conn.

Andrew Baird, " " "

Collis & Lawrence " " "

Slate & Brown, Windsor Locks, " "

Gage, Nashua, N. H.

Machine shop, Manchester, " "

Louis F. Lanney, Baltimore, Md.

J. H. Baerddid, 179 Chambers st. N. Y.

J. Fanning, Rochester, " "

G. W. Hunt, 41 Gold st. " "

Chamberlain & Waldo, " " "

P. S. Burges, carriage maker, " " "

Samuel Miller, " " "

J. Leggett, Steverson falls, " "

J. E. Harris, Hillsdale, " "

John L. Graham, Albany, " "

David Dalsell, South Egremont, Mass.

Roys & Wilcock, Berlin, Conn.

Agents for the sale of Tuyeres:

B. B. Stevens in New York and Connecticut.

A. J. VanAllen has the Agency for the Western and

Southern States, and is now travelling through those

States. Any communication addressed to the patent-

tee will receive prompt attention.

E. HARRIS, Patentee,

Springfield, Mass.

November 23, 1849.

Railroad Lanterns.

COPPER and Iron Lanterns for Railroad Engines, fitted with heavy silver plated Parabolic Reflectors of the most approved construction, and Solar Argand Lamps; manufactured by

HENRY N. HOOPER & CO.,

No. 24 Commercial St. Boston.

August, 16, 1849.

6m33

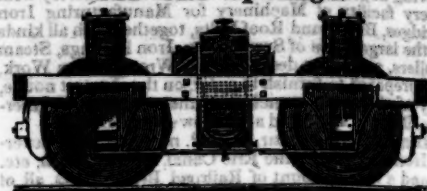
Gas Fixtures.

FIXTURES for Burning Gas for Lighting Public Buildings, Private Dwellings, Stores and Factories, manufactured by the subscriber in great variety. Orders by Mail, or left at the Factory on Causeway street, will be promptly attended to.

HENRY N. HOOPER & CO.

Boston, March 23, 1850.

F. M. Ray's Patent India-rubber Car Springs.



India-rubber Springs for Railroad Cars were first introduced into use, about two years since, by the inventor. The New England Car Company, now possesses the exclusive right to use, and apply them for this purpose in the United States. It is the only concern that has tested their value by actual experiment, and in all arguments in favor of them, drawn from experience of their use, are in those cases where they have been furnished by this company. It has furnished every spring in use upon the Boston and Worcester road, and, in fact, it has furnished all the springs ever used in this country, with one or two exceptions, where they have been furnished in violation of the rights of this company; and those using them have been legally proceeded against for their use, as will invariably be done in every case of such violation.

The Spring formed by alternate layers of India-rubber discs and metal plates, which Mr. Fuller claims to be his invention, was invented by Mr. Ray in 1844.—In proof of which we give the deposition of Osgood Bradley, of the firm of Bradley & Rice, of Worcester, Mass., car manufacturers, and men of the highest respectability. In this deposition, in relation to the right of parties to use these springs, he says:

"I have known Mr. Ray since 1835. In the last of May or the commencement of June, 1844, he was at my establishment, making draft of car trucks. He staid there until about the first of July, and left and went to New York. Was gone some 8 or 10 days, and returned to Worcester. He then on his return said he had a spring that would put iron and steel springs into the shade. Said he would show it to me in a day or two. He showed it to me some two or three days afterwards. It was a block of wood with a hole in it. In the hole he had three pieces of India-rubber, with iron washers between them, such as are used under the nuts of cars. Those were put on to a spindle running through them, which worked in the hole. The model now exhibited is similar to the one shown him by Ray. After the model had been put into a vice, witness said that he might as well make a spring of putty. Ray then said that he meant to use a different kind of rubber, and referred to the use of Goodyear's Metallic Rubber, and that a good spring would grow out of it." There are many other depositions to the same effect.

The history of the invention of these springs, together with these depositions, proving the priority of the invention of Mr. Ray, will be furnished to all interested at their office in New York.

This company is not confined to any particular form in the manufacture of their springs. They have applied them in various ways, and they warrant all they sell.

The above cut represents precisely the manner in which the springs were applied to the cars on the Boston and Worcester road, of which Mr. Hale, President of this road speaks, and to which Mr. Kneivitt refers in his advertisement. Mr. Hale immediately corrected his mistake in the article quoted by Mr. Kneivitt, as will be seen by the following from his paper of June 8, 1848. He says:

INDIA-RUBBER SPRINGS FOR RAILROAD CARS.—"In our paper yesterday, we called attention to what promises to be a very useful invention, consisting of the application of a manufacture of India-rubber to the construction of springs for railroad cars. Our object was to aid in making known to the public, what appeared to us the valuable properties of the invention, as they had been exhibited on trial, on one of the passenger cars of the Boston and Worcester railroad. As to the origin of the invention we had no particular knowledge, but we had been informed that it was the same which had been introduced in England, and which had been subsequently patented in this country; and, we were led to suppose that the manufacturers who have so successfully applied this material, in the case to which we referred had become possessed of the right to use that patent. It will be seen from the following communication, addressed to us by a member of the company, by which the Worcester railroad was supplied with the article upon which our remarks were based, that we were in an error, and that the springs here introduced are an American invention, as well as an American manufacture. How far the English invention may differ from it we have had no opportunity of judging."

AMERICAN RAILROAD JOURNAL.

STEAM NAVIGATION, COMMERCE, MINING, MANUFACTURES.

HENRY V. POOR, Editor.

ESTABLISHED 1831.

PUBLISHED WEEKLY, AT No. 136 NASSAU ST., NEW YORK, AT FIVE DOLLARS PER ANNUM IN ADVANCE.

SECOND QUARTO SERIES, VOL. VI., No. 35! SATURDAY, AUGUST 31, 1850.

[WHOLE No. 750, VOL. XXIII.]

ASSISTANT EDITORS,

J. T. HODGE, *For Mining and Metallurgy.*
GEN. CHAS. T. JAMES, *For Manufactures and the Mechanic Arts.*
M. BUTT HEWSON, C. E., *For Civil Engineering.*

PRINCIPAL CONTENTS.

Memorial of the Iron Manufacturers of Penn.	545
Oxygen	546
Construction of Permanent Way	547
Public Schools in Maine	547
Norwich and Worcester Railroad	548
Statistics of Iron Manufacture in Pennsylvania	548
Freezing of Water	548
Tonnage of Maine	548
Stirling's Patent Cast Iron	549
Mobile and Chicago Road	549
Atlanta and Lagrange Railroad	549
Iron Bridges—Cause of the Accident on the N. York and Erie Railroad	550
Railroads in New York	551
Illinois	551
Ohio and Mississippi Railroad	551
Panama Railroad	552
Railroad Securities	553
Iron Manufacture in New England	553
European and North American Railroad	553
Illinois	553

American Railroad Journal.

PUBLISHED BY J. H. SCHULTZ & Co., 136 NASSAU ST.

Saturday, August 31, 1850.

American Iron Manufacture.

MEMORIAL.

To the Senate and House of Representatives of the United States of America, in Congress assembled:
Continued from page 529.

To whom, then, enures the advantages of cheap foreign iron? Abundance of food is no more beneficial to a man in the agonies of a fatal disorder, than cheap iron to a paralyzed industry. The ability of the country to consume iron depends on the vigor and activity of all departments of industry. If agriculture languishes, the consumption of iron is diminished; if the machinery of the north is idle, or partially so, the demand for iron falls off, and so if cotton or sugar are selling at inadequate rates.

At the present moment various interests are suffering from the utter stagnation of the iron trade, as the operatives in iron will this year, 1849, consume in supply of their wants some twelve millions of dollars less than in 1847. This alone is enough to carry serious injury into numberless channels of industry. It especially affects the consumption of

cottons and woollens; for the use of these can be abridged to a greater extent than food. All interests are, therefore, bound together by common ties; when one suffers all suffer. It is a great mistake to suppose that the producers of cotton, sugar, rice and tobacco, have no special interests in the activity of manufacturing industry in the other states. A very large proportion of the cotton crop is now consumed in the U. States, and thus kept from the British market, already so liberally supplied as to give British merchants control of the price. When British iron is exported to us for want of a market at home, we take it at our own price; when we order large quantities of iron we pay what they can exact. Our cotton is mainly exported, disgorged upon the British market, and the price is made in Liverpool. When British manufacturers shall be compelled to come hither for their cotton, the price will be made by the planters. The present supply is so large, that the price is yearly the result of mere speculation. What is sold in this country is clear gain to the planter, as the whole crop would sell for no more in Great Britain than the quantity which now goes there. If half the crop was consumed at home the other half would sell for as much in Great Britain as is realized for the quantity now exported. This result is not only attainable under favoring legislation—but it might have been attained before now, by that wise policy which stimulates home industry to its utmost capacities. By such a policy the consumption of cotton and iron could be doubled in a few years, with immense advantage to the wealth and happiness of our whole population. It is the interest of the planter not to struggle for that division of labor among nations; which makes one nation a planter of cotton; another of sugar; another a maker of iron; another a spinner; another a weaver; another a tailor; and so on: but that division of labor which mingles these pursuits in the same country, in the same county, in the same town, and, to some extent, on the same plantation. This is the division of labor which begets a vast production and consumption at home, and an internal trade with which no foreign commerce can ever vie.

Who can doubt, that if the planting states were legislating for themselves, their first care would not be to become more independent, to diversify their labor and vary its products? What such legislation would compel them to do, they can now do under that national legislation which is invoked by others. They are already entering upon that career—it will be found not only the sure road to prosperity for them, but also for us. We so fully confide in the doctrine of the division of labor at home, that we not only trust the cotton planters will manufacture as much of their cotton at home as they can, and feed the operatives thus employed, but also manufacture as much of their iron as they can. There is room for all, work for all, and market at home for such a large portion of our products that the remainder will not overcharge the

channels of foreign commerce and be sacrificed for the advantage of foreign merchants and manufacturers.

We object to the doctrine that industrial pursuits are subordinate to foreign commerce; and that the latter is to be considered as the rightful patron of industry. In our view, industry stands first in natural order, and should be the first care of the legislator. Commerce is merely an agency, the charges of which, as well as its powers, should be kept to the lowest point consistent with efficiency. It may suit those engaged in commerce to insist upon the "Let us alone policy," for doubtless merchants can take care of themselves, and thrive not the less, when the producers, from whom their profits come, are suffering most. The manufacturer has, in all countries, asked for special legislation, and under its good effects the present manufacturing systems of Europe and this country have grown to their present magnitude. The relative importance of the domestic production of this country and its foreign commerce, may be seen in the fact that our foreign commerce yields from six to eight dollars worth of foreign commodities to the consumption of each individual of our population; whilst the domestic industry of the country furnishes not less than from 75 to 100 dollars for each person. Shall we pursue a policy impairing the power that produces the larger supply, in the vain attempt to add the worth of a dollar or two a head to the quantity of foreign commodities consumed?—And be it noted, that every dollar a head added to our consumption of foreign goods adds over 21,000,000 dollars to our imports.

If an ample supply of iron be indispensable to national progress and national welfare, and if the whole of that supply cannot be imported as cheaply as it can be made at home, the principle which should govern legislation applied to this industry and to others in like circumstances, is clearly discernable. If home production, on which we rely for more than three-fourths of our consumption, is not sustained in that activity which ensures its proceeding with economy and advantage, it must flag; and the product being diminished, a greater demand must be thrown upon the foreign market, enhancing the prices of importation. But if the home production is adequately sustained by a free market, it can supply all the channels of consumption. Legislation, making closely the line of vigorous production at home, will encourage importation, with the double purpose of obtaining revenue and keeping the manufacturers at home to fair prices.

Sustain the domestic manufacturer at the point of full production, and then admit the foreign article freely. The more closely our revenue enactments approximate this object, the more perfectly will they encourage domestic industry, obtain the largest attainable revenue, and best secure the interests of consumers. The manufacturer, constantly struggling to keep up his prices, will be as con-

stantly met by foreign iron, selling at such rates as to keep him to the line of public advantage. It is the operation of a well managed competition between the domestic and foreign producer, which results in the greatest benefit to the consumer. If the consumer is driven to a foreign market for his supplies, or for too large a proportion of them, prices will be inordinately advanced against him; while, if the foreign market is prohibited, or too heavily burdened, the same undue advance may take place at home. But if foreign iron is introduced at the point designated, it not only works no injury, but produces positive public good, as to revenue and prices, and also as to the increased consumption of iron. There are certain average rates, at which manufacturers of iron in this country can live and flourish, and these rates are very little, if any, above those to which the often-recurring fluctuations of prices in Great Britain are carried. At these rates, which are easily ascertained by the legislator, the line of competition can be established with the greatest advantage to the consumer. They will not exclude foreign iron; but frequently attract it. During the last fiscal year, the very large importation of 315,000 tons of iron has taken place. Of this, much the larger proportion has probably been sent to us on foreign account, because there was no demand at home; it was sent to save the home market, already broken down, from further depression. It has broken down our markets; and, if sold at present rates, will not yield the makers a penny of profit. The iron, coming thus to a bad market, came because it would have been worse for the holders to keep it at home. If previous legislation had shielded our market so as to maintain prices remunerating to our manufacturers, the additional duty necessary for this purpose would not have deterred the export of iron to this country; for, while those who shipped it to our ports must have paid a higher duty, they would have realized better prices. A ton of iron rails, under the present tariff, at the prices prevailing in 1846 and 1847, was charged with a duty of twenty dollars, which was almost prohibitory, and therefore produced little revenue, making foreign rails cost 90 dollars per ton. During the year 1849, a ton of rails has been charged with only eight dollars, and has, of course, produced but little revenue; whilst a ton of rails were laid down in our market at 45 dollars, injuring the domestic producer to an extent that is incalculable. A system of revenue which would meet the low prices by a proportionate increase of duty, and make provision for high rates by a like reduction, never excluding the foreign iron, would, we believe, meet the exigencies of domestic industry, and greatly increase the revenue. Whatever may be the advantages of the *ad valorem* system in other cases, they are more than neutralized by the fluctuations of the prices of British iron. It is true that a part of this objection applies with equal force to specific duties; for, when these are high enough to meet the difficulty of low prices, they become prohibitory when prices rise. These considerations furnish a strong inducement for special provisions in our revenue system in regard to foreign iron. A system could thus be devised which would give a mighty impetus to the production and consumption of iron, and to other dependant branches of industry. A home competition could be thus ensured, which would, in the end, reduce the price of iron to the lowest limits consistent with undiminished production. Under such a policy, we should soon surpass Great Britain in the quantity of iron made and consumed, as much as we do now in the quality. We should employ hosts of laborers, and attract them hither from all quarters of the world; and for every million of people which this scene of industry would draw to our shores, we should be furnished with an additional home market, equivalent in amount, and far more remunerative, than the average export of our foreign trade.

In closing this memorial, we ask your intervention in our favor, and the insertion of such provisions in our revenue laws as will "regulate commerce with foreign nations" in iron, and exclude from our markets the results of those destructive fluctuations and irregularities which originate in foreign causes, and should expend their force on foreign shores. This being done, we only ask further that such duties be imposed upon foreign iron

as will bring the largest revenue to the public Treasury.

Oxygen.

In the articles, "Curiosities of the application of Sand," vol. i. p. 12, "Lime," vol. p. 207, and "Alumina the Earth of Clay," vol. ii. p. 33, we have endeavored in a popular manner, to point out the leading properties of the most useful and most abundant of those compound substances which make up the greatest part of the earth's crust.

We now purpose extending the series by a few papers on some of the elementary or simple bodies, which not only perform a most important part in the formation of the compound substances, the earths already noticed, but equally pervade the whole of inorganic nature, and reappear in still greater activity in the organic world of life.*

Oxygen, from its activity and universality in nature, and from its being so pre-eminently the connecting link between the earth and her children, lays first claim to our attention, and the remainder of this paper will be devoted to the consideration of its properties, and to the history of its discovery, and the circumstances closely connected with it. Oxygen, when prepared with the greatest care, is an insipid and colorless gas, which remains elastic under the greatest pressure and the most intense cold. Its specific gravity is 1.11; that is, in equal bulks, it will weigh nearly one-ninth more than common air. It is called an elementary or simple substance, because all the skill of the analyst fails to extract any matter differing from itself. It is said, therefore, to resist decomposition, and the terms elementary or simple are used in contradistinction to compound, which signifies a liability to chemical decomposition—i. e., a resolution or separation into ultimate component parts.†

The importance of this element—oxygen—may be estimated by considering the numberless instances of its presence and abundance. Of silica it forms one-half. Here we have a striking example of the vastness of its quantity, and the universality of its presence. Granite, which appears to be the foundation rock of the earth, is nearly pure silica; and we need not remind the reader of our previous article on sand, of many other instances of its presence and value. Next to sand we value lime, and in limestone nearly one-half (24-50ths) is oxygen. In clay, more than half is oxygen; and if we were to measure the rocks of the earth, and deduct the amount of sand, lime and clay—or rather of silica, lime and alumina—how small a portion would remain; we think less than one-twentieth part of the whole, and oxygen would still have a large share in the remainder. Of the rarer earths, magnesia, barytes, strontia, glucina, &c., it forms a part.‡ The metals, well known as they are, form but a very small portion of the soil, yet they are all usually found as oxides, containing from about one twenty-seventh to two-thirds of their weight of oxygen. By far the most generally distributed metal is iron, and it is commonly found as an oxide, containing more than one-third of oxygen. Leave the

* *Inorganic*.—The constituents of the earth, as rocks, stones, minerals, water, air, &c. *Organic*.—The compounds formed by the action of the principle of life, both animal and vegetable. Organic bodies are always compounds; inorganic bodies may be either elementary or compound.

† We use the word *matter* advisedly. Latent heat, electricity, and, very possibly, light, if not combined with, are at least very intimately associated with, every so-called element. We regret that the present state of popular science is such as to compel us use more ambiguous language than we could wish, though we hope it is sufficiently plain to set some of our readers thinking for themselves. As we are constitutionally opposed to mere speculative philosophy, we must at the outset warn against the assumption of any hints as proven facts; and though we shall be very glad to have any one's deliberate opinions, whether in accordance with or opposed to our own, yet we feel quite warranted by our experience to say, we must decline any controversy or disputation, as being more calculated to beget strength of opposition, rather than a just appreciation of truth.

‡ The proof of this is due to Sir Humphrey Davy, born 1778, died 1829.

dry land and return to the sea. Oxygen forms eight-ninths of water. Mount the air—one-fifth is oxygen. Thus, in the whole domain of inorganic nature, we see the importance of oxygen; and so great is its activity in combination, that it unites with all the known elements, save one (fluorine), directly, and with that one indirectly. Of six hundred and fourteen references in Berzelius' celebrated treatise on the blowpipe, twenty-nine are to minerals without oxygen, and this only when the exceptions are in a state of absolute purity; a circumstance which, in the ordinary course of events, would not occur once in twenty-nine times six hundred and fourteen instances. Absolute purity is seldom attained even by the most elaborate applications of art, more rarely by the unaided efforts of nature; and thus, though regarded as accidental, yet oxygen exists in many, if not in all, of the so-called exceptions in the natural state.

Having thus traced oxygen throughout the inorganic world, it remains to show its importance to the organic; but we must content ourselves with a mere allusion to its activity in the compounds pertaining to vitality, reserving a more extended enumeration of its services in this particular, until, in our future essays, we can consider the compounds themselves. Beginning with the link between stone and vegetable—coal, we find it present in quantities varying from three to thirty per cent.—In wood—i. e. the basic or solid part of all plants—and in flesh, it is equally abundant, and even more essential, and it is absolutely necessary for the due performance of the highly important function of respiration.

The industrial arts are greatly indebted to its services. Metals are extracted from their ores by its withdrawal, and, on the other hand, the colors of the painter and the dyer are frequently due to its addition. With lead it forms litharge and red lead; with iron, crocus. Indigo, partially deprived of it, becomes soluble and colorless, penetrates the finest tissues, then re-absorbs it, becomes brilliant and permanently fixed. Bleaching is often effected by its assistance, and vinegar-making is entirely dependent upon it. Sulphuric and nitric acids are the results of its combinations with sulphur and nitrogen, and through these two acids it is introduced into countless operations of manufacture.—We have intentionally delayed until now any mention of its most important duty—its activity in ordinary combustion; and it must be remembered that respiration causes the combustion of the principal portion of our food. The atmosphere is the source whence our fires derive their supplies, and to withhold it is to extinguish them.

In combustion, oxygen unites with the burning body, and at the same time heat is always, and light often, most freely evolved. A body, therefore, is not annihilated by burning, but its constituent principles are liberated entirely, or form fresh combinations with oxygen, and thus every substance acquires weight by combustion, the increase of weight being exactly that of the oxygen absorbed.

The product of combustion may be a gas, as when charcoal is burnt, and forms carbonic acid gas; a liquid, as when hydrogen is burnt, and forms water; or a solid, as when zinc is burnt, and forms an oxide or calx. Hence, oxygen has been termed "the supporter of combustion." This is not quite appropriate, though of ordinary combustion it appears* to be true. We will, however, mention two of many exceptions: hydrogen and most of the metals burn with chlorine and with sulphur, oxy-

* We say *appears*, because the modern material atomic theory scarcely admits of the presence or action of the substance, force or property—heat—as an *essential*; and if, at some future day, heat, or some analogous principle, should be shown or be supposed to have a positive and individual existence, then, as heat is present in every case of combustion, the modern theory may be upset, oxygen discarded from the list of active agents, and heat, or its relation be substituted in its place. We say this, not from any desire to render a rough road still more toilsome but to remind the reader that many modern chemical theories—i. e. hypothetical explanations of chemical phenomena—are merely guesses at truth. They may be, and we think frequently are correct, but we must warn against their too ready reception as absolute demonstrations.

gen being entirely absent. Besides, we cannot strictly apply the term "supporter of combustion" to one body only. A jet of hydrogen appears to burn in an atmosphere of oxygen, but equally the same effect results from an ignited jet of oxygen in an atmosphere of hydrogen. In the patent smoke consuming furnace of Mr. Charles Wye Williams, iron pipes, perforated with numerous holes, admit jets of common air—and consequently oxygen—into the heated smoke. On looking into the fire, it would seem that jets of inflammable gas from the various holes and burning in air, whilst the fact is the reverse—jets of air are issuing into the gas of the smoke, and which is to be called "the supporter of combustion" we are unable to decide, for both are equally active; it reminds us of the negro's pair of dogs—"Massa! um dogs 'dential like—specially Pompey." The peculiarity of the position has been illustrated as follows:—Could we live in an atmosphere of coal gas, and have gas pipes supplied with oxygen, each jet would afford a flame as brilliant as now, and we should say, oxygen was burnt, and coal gas supported combustion; whereas we now say just the reverse. Tho' oxygen cannot lay an exclusive claim to the honors of the phenomena of combustion, yet it possesses many very remarkable properties, which are strikingly exemplified when the gas is pure. A candle with a long snuff being extinguished, and immediately plunged into a jar of oxygen, is instantly reignited, and burns with far greater brilliancy and rapidity. A piece of glowing charcoal, immersed in an atmospheric oxygen, burns in a most brilliant manner, giving off showers of most splendid sparks; and if attached to the end of an iron wire, or, still better, a piece of steel watch spring, the metal also becomes ignited, and burns even more rapidly than a pine match in common air. The most vivid light, though the most transient, is produced by the combustion of phosphorus. The result of these combustions is in every case an oxide; this term being used in its general sense, as applied to all bodies combined with oxygen. Charcoal, burnt in oxygen, combines with it to form an oxide, which is also a gas at ordinary temperatures and pressures, and is well known as carbonic acid gas. Iron, in the same circumstances, yields an oxide of iron, resembling that formed on hot iron in the open air—smith's scales. It will be noticed, that in these instances one product is called an acid, and the other an oxide; both are compounds of oxygen with other substances, and therefore, in a general sense, are both oxides; but the terms in scientific language are employed with a view to mark the leading peculiarity of the products, bodies called in technical phraseology—acid, possessing certain distinctive properties from those to which the term oxide is arbitrarily confined. It will thus be evident that all oxides are not acids, but the reverse was at one time the generally admitted theory; and hence the name oxygen, derived by Lavoisier, the French chemist, from two Greek words, signifying "acid maker," for he held that all acids were oxides. It has since been shown that there are true acids without oxygen, the most generally known being hydrochloric acid, a name synonymous with muriatic acid, marine acid, and spirits of salt. But we are no sooner clear of one theoretical difficulty than we fall into another; for it has subsequently been urged, that as there are true acids in which hydrogen and not oxygen is present, and as none of the so-called oxygen acids exhibit their acid properties in the absence of water—a compound of hydrogen and oxygen—therefore, there is no real acid without hydrogen, and it should be called "acid maker." In short—or very nearly—that oxygen and hydrogen should change names. "Who should decide when doctors disagree?" we shall therefore leave this very pretty quarrel as it stands.* This controversy is a very good illustration of one of the many difficulties attending a speculative theory. Many are the dan-

gers incident upon a theory which cannot accept a fact as a fact, but must weave some fine-strained web of special pleading, in the vain hope of controlling these stubborn realities. To many it may now appear to be out of date, if we advocate a strict regard to experiment. The superficial observer may consider he has sufficient guarantee against hypothetical perversion, in the respect paid to the memory of Lord Bacon, the founder of experimental philosophy, and in the fashionable pursuit of *soi-disant* practical science. But let us illustrate our meaning by an example: The doctrine of chemical equivalents, or proportionally combining weights, appears to be as clearly demonstrated as the present state of science will admit; but who can point to one fact that proves the existence of atoms? *i. e.* little indivisible, unalterable, unchangeable lumps! yet active everywhere but in themselves, for in their own diminutive bodies they are impenetrable, and possess nearly every negative quality. We should not call a Maypole an active agent, merely because it was surrounded by a troop of dancers; we should say that the dancing was owing to the actors, and not to the Maypole. We should also say that they could choose their own steps and figures, and that the nature of the dance would in no way depend upon the nature of the pole, or centre of attraction. And further, that if anything was really requisite to limit their movements, it might with equal reason be external or internal; they might discard the pole, and confine themselves within the circumscribing walls of a room, or amidst the intervals of other circles—like the bubbles of foam—as well as round a solid centre or atom. So with matter. If it is composed of small solid centres—Maypoles—possessing all their powers and forces of gravity, electricity, repulsion, attraction, &c., the dancers around them, in what do they differ from our fanciful suggestion? And when we consider the difficulties of the atomic theory, respecting, light, heat and electricity—difficulties, many of which are beautifully set forth and illustrated by facts in Faraday's speculation touching electric conduction and the nature of matter—*Practical Mechanics' Magazine*, vol. iii. page 197—may we not think this guess to be even nearer the truth? a guess which supposes the dance to rest with the dancers, and not with the stick in the centre. But it is impossible to exercise too much caution in adopting a theory upon the most plausible supposition—true it is that

"Dangers past all calculation,
Beset the man of speculation;
Who, to possess an easy mind,
Should be half deaf and nearly blind."

To be continued.

Institution of Mechanical Engineers.

May 14, 1850. William Cubitt, Esq., President, in the chair.

"On the Construction of the Permanent Way of Railways, with an account of the wrought iron permanent way, laid down on the main line of the N. Midland railway," by Mr. W. H. Barlow.

The author commenced by entering into the question of the maintenance and renewal of the ordinary railways, analysing very minutely the expenses under the different heads, and showing to what causes the derangement of the line might be attributed. The cost of maintenance was stated to be dependent on two causes—the effect of weather, etc. and the disturbance produced by traffic; and from a summary of the expenditure of the different lines belonging to the Midland company, it appeared that the former amounted to £20 or £30 per mile per annum, and the latter varied from 2d. to 2s. 7d. per train per mile. After a line was consolidated, by far the greater part of this expenditure was due to the derangement caused by the passage of the trains, which first produced an uneven joint, then loosened the joint key, and then disturbed the sleeper, so that at length the whole of the permanent way generally was degraded.

With regard to renewal, it had been estimated by the officers of the London and Northwestern railway, that, on their line, the rails would last 20 years, and the sleepers, if "creosoted," 20 years, but if unprepared, only 12 years. Now, as the duration of service of the rails was dependent on the amount of the traffic, and that of the sleepers on the weather, it was quite evident that, on lines hav-

ing less traffic than the London and Northwestern, the proportionate expense of renewing the sleepers would be much greater, and would increase as the amount of traffic diminished.

In endeavoring to seek a remedy for this, the author conceived, that, by increasing the dimensions of the bridge rail, sufficient width might be obtained for it to take its own bearing in the ballast, without the use of either transverse sleepers or longitudinal supports; and, moreover, that such a construction would possess great strength, be very durable, and be capable of being renewed at a moderate expense. He therefore proposed a bridge rail, 13 inches in width, 5½ inches in depth, and weighing 126 lbs. per lineal yard. There was some difficulty at first in getting it manufactured, but Messrs. Bolckow & Vaughan, of Middlesborough-on-Tees, had overcome all the practical difficulties, and now produced rails of the required size, with hard metal in the upper portion, and ductile metal in the lower, by which both durability and strength were insured. The joint was made by either a cast or wrought iron chair, or saddle, which received the ends of the rails, and into which they were keyed with wooden keys. The gauge was preserved by means of a tie bar, fitted and keyed into sockets on the chairs.

An experimental length of road on this construction had been laid down on the main line of the North Midland railway, the cost of which was £3,323 per mile; but it was thought that in future this might be reduced to £2,487 per mile, by reducing the weight of the rails to 100 lbs. per yard, and the chairs in proportion, as it was found by experiment that these rails were greatly in excess of strength, being as much as three times stronger than that of the ordinary double headed rail.

A mile of road had also been laid upon the same line, with cast iron sleepers adapted to the ordinary rail, as introduced by Mr. P. W. Barlow, M. Inst. C. E.; and another mile had been laid with these cast iron sleepers at the joints only, but having intermediate sleepers of timber.

The motion of the trains over their several experimental lines was firm and steady, there being no perceptible difference between the two latter descriptions.

In the discussion which ensued, in which Messrs. Hawkshaw, Brunel, Locke, M.P., P. W. and W. H. Barlow, and Glynn, took part, the relative advantages and disadvantages of the different systems of permanent way in present use were discussed, and also, in some slight degree, compared with that proposed by W. H. Barlow; but it appeared to be a general opinion, that no one system of laying a permanent road could at present claim a great superiority over any other; and that, in reality, much more depended on the good quality of the materials used in its construction, than in any particular way of laying it. The objects to be attained were—simplicity of construction, so that there should be as few parts as possible to get out of order, a perfect joint, and economy of maintenance; and tho' the two first of these desiderata were admitted to be obtained in a permanent way with bridge shaped rails and longitudinal timber sleepers, it was contended that they were, to some extent, counterbalanced in a road laid in the ordinary manner, with double headed rails and cast iron chairs, as, in some instances, after being turned, the second table was found to be more durable than the first.

Public Schools in Maine.

During the last three years 4467 teachers have attended one or more of the institutes. The whole number of teachers employed in the State in the year ending April 1st, 1850, was 5989. The returns, however, are thought to embrace but seven-eighths of the whole. The average rate of wages for male teachers was \$16 66 a month; females \$1 46 per week. The number of school districts returned was 3350. Number of school houses 3063. The whole number of persons between four and twenty-one years, in the districts returned, was 194,005; number attending school in summer 110,009; in winter 133,413. Amount of money raised by tax for the support of public schools in 1849 in the 391 towns and plantations making returns,

* Anhydrous, *i. e.* perfectly dry sulphuric acid, by fusion with caustic alkalis, forms sulphates; so does silicic acid form silicates; both being examples of the acid action of bodies containing no hydrogen, they have been held to prove the activity of pure oxygen acids; all going to prove the old legal axiom, "that a great deal may be said on both sides."

\$221,923 55, being \$52,384 23 more than the lowest sum required by law.

Connecticut.

Norwich and Worcester Railroad.—At the recent annual meeting of this company, the following gentlemen were chosen directors viz:

Joel W. White, president; Alex. DeWitt, Wm. A. White, Elihu Townsend, David A. Neal, Jedediah Huntington, J. Newton Perkins, J. A. Rockwell, and Charles Johnson.

Ohio.

Jeffersonville and Columbus Railroad.—We are pleased to learn that this company is in a prosperous condition, and that the road bids fair to an early and successful completion. The cars are now running on the road. The whole route is under contract, and a number of hands have commenced clearing off the timber, and grubbing on the west side of Driftwood, in this county. Success to this invaluable improvement.—*Columbus Democrat.*

County.	Sold by Sheriff, or failed.	Date of construction.	Name of works.	Situation, P. O.	Owners.	Lessees.	Kind of power employed.	No. Blooming fires.	No. hammers.	Largest product Tons.	Actual make in 1849.	Form in which iron leaves the works.	Men and boys employed.	Horses, etc. employed.
Carbon,		1830	Marla,	Lehighon,	T. M. Smith and Est. of Richards,	None,	Water	2	1	10	65	"	6	3
"		1848	Pine Run,	Lehigh Gap, 7 1/2	J. J. Albright,	"	Water	2	1	80	80	"	12	8
"		1830	Ashtland,	Lehigh Gap, 7 1/2	N. Anthony,	"	Water	2	1	40	40	"	12	4
Monroe,		1843	Anthony's,	Stroudsburg,	John Jordan, Jr.,	"	Water	3	2	280	100	"	30	12
Northampton		1847	F. 1805	Jacobsonburg, Jacobsburg,	A. Benade,	"	Water	2	1	70	40	"	12	2

These six works all use the rich magnetic ores from New Jersey, and consume about 3 tons of ore and 15 cords of wood to the ton of bars produced. The average annual capacity is 50 tons per fire, which, for the 12 fires in the State, would give 600 tons of bars, consuming 9,000 cords of wood and 1800 tons of ore.

A DETAILED STATEMENT OF THE BLOOMERY FORGES IN EASTERN PENNSYLVANIA IN 1850.

These four forges all use steam. The one at Reading manufactures axles; the one at Papertown, blooms; that at Kensington steel plates, and the one at Frankford, saw plates.

County.	Sold by Sheriff, or failed.	Date of construction.	Name of works.	Situation.	Owners.	No. of puddling furnaces.	No. heating do.	No. forge fires.	Bituminous coal.	Anthracite coal.	Wood.	Pig.	Bloom.	Scrap.	Largest prod'ct.	Men, etc., employed.	Horses, etc. employed.	Capacity.
Berks,		1848 S	Reading,	Reading,	A. Taylor,	2	2	3	600	1000	1500	1000	450	100	400	14	3	600
Cumberland,		1849 S	Holley,	Papertown,	F. & M. Bank, Philad.	1	1	1	600	800	1500	1000	500	100	10	25	6	800
Philadelphia,		1849	Kensington,	Kensington,	J. Rowland & Co.	1	1	3	600	800	1500	1000	500	100	10	7	1	1000
"		1850	Frankford,	Frankford,	W. & H. Howland,	2	4	3	600	1800	1500	1000	950	1100	410	59	2	600

A Detailed Statement of the FORGES IN EASTERN PENNSYLVANIA, in the year 1850, not properly belonging to either of the other classes.

ed by freezing salt water, and experimentally showed the greater purity of water obtained by melting ice over common cisterns, and well-water, by the introduction of nitrate of silver into each. A still more perfect test was chosen, by the admixture of a solution of soap in spirits of wine. To show how this purity could be perfectly attained, notwithstanding apparently adverse circumstances, he mixed some water and sulphate of indigo, and by one of those happy expedients, for which he is famous, froze the mixture in a freezing compound by a revolving motion with one hand, as he kept stirring it with the feather end of a quill, so as to produce a cylinder of the purest ice. The experiment was repeated, with mixtures of water and sulphuric acid, and even of water and ammonia, and chemical tests were applied, to show the absence of all these several ingredients in the water produced from ice thus made, and the concentrated character of the residuum. By freezing all the water, he asserted that highly concentrated forms of these foreign bodies were produced. He showed by experiment, a fact which, previous to experiment, he had deduced by mere reasoning, in submitting ice to a heat of 300° Fahrenheit, when not exposed to the air (as under oil), which also renders water impure—and it exploded. He showed the fact of ice freezing to ice, and suggested some important consequences following from it; a similar power is created in a common snowball. But the introduction of gold leaf between two plates of ice prevents consolidation. He alluded, in glowing terms, to the labors of our distinguished townsman, Dr. Thomson, on the subject of the influence of pressure on freezing water. A pressure of eight atmospheres will lower the temperature of water, which while under the influence of fifteen atmospheres, will freeze; but an immense pressure prevents freezing. This pressure tends to liquify ice, and vice versa. It is unnecessary to point out to our readers, as Mr. Faraday appeared to think it unnecessary to him, the necessity of the law of gravitation, being taken into consideration in chemical theory, as these experiments show it should. The lecture was listened to with the deepest attention and interest by the most crowded audience of the session, comprising a large body of scientific men, and fashionables, whom we are always happy to see together.—*Prac. Mech. Jour.*

Tonnage of the United States.

Hunt's Merchants' Magazine for July contains a statement of the tonnage belonging to each collection district in the United States for 1849, from which we extract a few items which will prove interesting to our readers. We give the several districts of Maine entire:

	Registered.	Enrolled and licensed.	Total of each district.
Passamaquoddy,	7,549 76	9,566 99	17,116 75
Machias,	1,369 65	18,958 09	20,327 75
Frenchman's bay,	2,616 47	29,020 28	31,636 85
Penobscot,	5,794 91	30,689 29	36,581 25
Belfast,	10,569 46	32,504 27	43,073 73
Bangor,	11,168 14	13,548 14	24,716 55
Waldoborough,	31,975 02	56,740 49	88,715 51
Wiscasset,	5,068 40	12,020 89	17,089 44
Bath,	61,938 38	26,882 46	88,820 81
Portland,	57,657 01	26,011 79	84,568 80
Saco,	1,000 19	1,631 11	2,031 30
Kennebunk,	7,766 57	3,083 03	9,849 60
York,		1,057 44	1,037 34

466,498 06

Canada.

We see it stated that the railroad contemplated from Niagara Falls via Hamilton, to Sandwich, opposite Detroit, is to be put under contract and commenced forthwith. From the suspension bridge at the Falls to Sandwich is 240 miles, and with the exception of getting up and down a mountain at Hamilton, the grade of the road is almost a dead level. Between Hamilton and Sandwich there is one portion of the road running fifty miles in a straight line.

Royal Institution. Professor Faraday "On Certain Conditions of Freezing Water."

The last Friday evening meeting of the session was occupied with this subject, and the results of the researches made by this celebrated chemist appear to point to discoveries of importance, as the following concise report of the discourse will show;—The professor commenced by calling attention to the extraordinary attraction exhibited by particles of water among themselves, as compared with particles of water with other things. Chemical affinity and chemical attraction are but names of proceedings in nature which we do not as yet understand. He alluded to the purity of ice, and exhibited a block, weighing 140 lbs., from Norway, whence ice is now ordinarily obtained, and not, as lately, from America. There is no purer substance than ice, and this purity is attributable to the perfect expulsion from water of everything but itself. He stated there was no trace of salt in ice produc-

Stirling's Toughened Cast Iron.

One of the most recent of the practical novelties connected with the iron manufacture, is the system of toughening and strengthening the metal patented by Mr. Morris Stirling, whose late researches have opened up several new features in this most important branch of our staple productions. We say practical novelties, to distinguish the invention from the great mass of mere schemes which melt away to nothingness on the first working test—bringing discredit on their propounder, and disgusting the practical man who is tricked into a trial of their capabilities. That Mr. Stirling's improvement does not belie its name, has been satisfactorily established by its fast extending introduction in constructive engineering, and the uniform good opinion which has been expressed upon it by the first engineers of the day.

The process is so extremely simple in practice, that it hardly deserves the name. All that is done, is the placing pieces of wrought or scrap iron in the moulds used in forming the pigs of metal run from the blast furnace; the melted cast iron surrounds the solid scraps, and the incorporated mass becomes what, in the "prices current of metals," is termed "Stirling's patent toughened pig." In this state the iron is sold to the consumer, and when remelted in the founder's cupola for use, the mixture enters into chemical combination, producing, as the inventor remarks in his evidence before the commissioners appointed to inquire into the application of iron to railway structures, "to a certain extent, a diminution of the quantity of contained carbon, an alteration in the structure, and a differently formed grain."

Cast iron, so compounded, becomes close in the grain, and without any injury to its fusibility, has imparted to it an extraordinary toughness. In this way, while the great facilities of application of cast iron are fully retained in the toughened metal, many of the excellencies of malleable iron are given to it, making it, for all purposes where strength and lightness are essentials, a most valuable material for the railway engineer and the builder, and for many of the purposes of the general iron founder. The strength of the iron, of course, varies with the proportions of the added wrought metal—the average superiority over ordinary cast iron being from 60 to 70 per cent., while the maximum increase has been experimentally demonstrated to be 120 per cent.

In commencing his experiments, Mr. Stirling's idea was simply to improve or elevate the standard of the inferior irons—that is, to bring up the strength of the weaker and more fluid irons to an equality with the better kinds; but in working out these experiments, the remarkable fact came out, that all classes of iron are, by this admixture, brought to a general average strength, far exceeding that of the best cast iron. Taking Mr. Hodgkinson's results, we find that to break a bar of Blaenavon iron 1 inch square, and 4 feet 6 inches between the supports, requires an average of only 454 lbs.; the highest result being 578 lbs. In Mr. Stirling's own experiments with his toughened iron, the breaking weight of 868 lbs. has been reached; while Mr. Rennie, using Mr. Stirling's method, obtained more than 900 lbs.; the average may be taken at about 750 lbs.

The proportions of wrought and cast iron depend both upon the locality furnishing the iron, and upon the number or quality mark of the maker. As a general rule, the Scotch iron requires the greatest amount of scrap; the Welsh the least; while the Staffordshire iron is between the two. For Scotch, No. 1, hot blast, from 24 to 40 lbs of scrap must be added to the cwt., according to the richness of the iron; No. 2 requires less—from 20 to 30 lbs.; while for general purposes No. 3, hot blast, is not recommended for mixture, except for large castings, for which 15 or 20 per cent. of scrap produces an admirable iron. Each of the qualities of Staffordshire and Welsh iron requires considerably less than these amounts.

One of the first inquiries to be made in reference to the commercial introduction of any improvement, relates to its cost. In the case before us, there is no increase in the cost of the iron, except in relation to the original quality of the metal from which it is made. Thus, Scotch pig iron at £2 10, when the expense of the malleable iron and the

patentee's royalty is added to it, costs from 10s. to 15s. per ton extra; but as a set-off, the iron so made is 60 per cent stronger than iron which commands a price of £3 15s. and £4 per ton. The improvement on the best iron is not so palpable as on the worst qualities, although Mr. Rennie's experiments show that the best or Blaenavon iron is improved as much as 67 per cent. In fact, the whole of the experimental tests go to show that the mixture tends to bring up all iron to its maximum strength; and whichever of the three kinds of iron is taken, a proper proportion of scrap ought to give it an average of 700 or 800 lbs. on the square inch.

The annexed sketch exhibits a transverse section of a cast iron beam, used in testing the strength of the toughened iron when applied for this purpose. Two beams of each kind of metal were cast from the same pattern by Messrs. Grissell, the experiment being conducted at the new Palace of Westminster, under the superintendence of Mr. Barry. The ordinary castings were a compound of hot blast, Scotch, Blaenavon, and old iron in equal parts; while the toughened metal was made up of 89 lbs. of Kinneil iron to 23 lbs. of scrap. The beams were of the same section throughout their entire length—12 feet 4 inches—the bearing distance being 11 feet. The power was applied by a Bramah press, in the centre of the beams; and the breaking weight of the ordinary beams was found to be 15-93 tons, with a deflection of 15-16ths inch. The toughened beams broke with 22-5 tons, with a deflection of 1 inch. In testing the permanent set of the beams, the ordinary beam acquired a set of 4th inch, with a pressure of 14-06 tons; but the toughened beam had a set of only 1-16th inch, with 16-87 tons.

The valuable report of the commissioners on the application of iron to railway structures, which we have previously quoted, shows that the new iron has been deemed sufficiently important to require a long and careful investigation along with the various specimens selected for experiment in the course of this extensive inquiry. In the trials of tensile strength, the second quality required 11-502 tons per square inch of section to break it; the highest result from Blaenavon being 7-466 tons. The average crushing strength of the second and third qualities was 54 and 64 tons respectively—Blaenavon, No. 2, 49 tons. The mixture for trying the transverse strength was No. 1, hot blast, Staffordshire, from Ley's works, with 15 per cent. of malleable iron, forming toughened metal of the third quality. The dimensions of the bars were: length 10 feet 17-120ths inch, weight 119 lbs.; weight between supports 106-97 lbs.; depth 2 inches; breadth 1-97 inches. The mean results, with a weight of 1,344 lbs., gave a deflection of 1-939 inches, with a set of 223 inch. The mean breaking weight was 1,470 lbs., with an ultimate deflection of 2-178 in. To compare such results with those of other kinds of iron, would obviously lead to considerable detail; but the practical worker in iron will be able to make his comparisons with the results of his own experience.

All engineers are agreed on the point of the superior strength derived from a mixture of various kinds of iron, and Mr. Fairbairn, in his evidence before the commission, cites Mr. Stirling's improvement as a very decided step in advance of all previous combinations, giving examples of the tests of girders, where the compound iron, compared with ordinary metal, was as 33-25 to 51-5.

Several of the most eminent iron masters in Scotland are licensees of the invention, and at the Dundee works a very extensive series of experiments has been tried upon various compounds of the Dundee iron. The mean breaking weight of the ordinary Dundee cast iron—in bars 1 in. square, 2 feet 3 inches between supports—has been experimentally ascertained to be No. 1, 860; No. 2, 926; and No. 3, 892. The same iron, No. 1, with 32 lbs. of scrap to the cwt., required 1,434 lbs. to break it; and No. 2, with 29 lbs. of scrap to the cwt., gave a result of 1,419 lbs. The great difference in the texture between malleable and cast iron and the observed behaviour of the former under intense heat, has all along led us to believe that any attempt at so curious a combination would result in a mere partial mechanical mixture; and, until Mr. Stirling actually showed that wrought iron does fuse and combine chemically with cast iron,

the idea was utterly scouted. The combination is, however perfect, and complete homogeneity is always secured when proper precautions are taken in mixing.

The iron is now being introduced in several large engineering works, for girders, beams, shafts and rolls; and the Corrugated Iron Wheel Company have, in several cases, specified it in their arrangements with contractors. Another branch of the invention provides for the strengthening of wrought iron, and the prevention of lamination under rolling pressure, as in railway bars. For this purpose, either common or toughened pig metal is alloyed with calamine in the puddling furnace. Another process comprehends the addition of a small quantity of tin to the iron in the puddling furnace. The metal thus treated is found to be very hard, crystalline, and anti-laminating. The iron is used for the surfaces of rails and wheel treads, by rolling it along with a greater bulk of the calamine iron.

As the practical results of the introduction of this toughened metal become developed, we shall follow up the subject with additional details.—*Practical Mechanics' Journal.*

Mobile and Chicago Railroad.

We copy the following from a statement laid before the House of Representatives relative to the route of this great work:

The best route for this great improvement has been ascertained by elaborate surveys. It passes through five states as follows: 62½ miles in Alabama, 271 miles in Eastern Mississippi, 119½ miles centrally in Western Tennessee, 39½ miles in Western Kentucky, and 375 centrally in Illinois; making the distance from Mobile to the mouth of the Ohio river 494 miles, and the entire distance from the Gulf Mexico to Lake Michigan 867 miles. Its general course, from Mobile to the Ohio river, is slightly west of north, thence to Chicago about the same degree east of north. It crosses no navigable stream (great or small) except the Ohio river, at or near its mouth. It is an average distance of 90 miles from the Mississippi river, and not less than 50 miles average distance respectively from the Illinois and Wabash rivers. Unobstructed by the tributaries of the Mississippi river on the west, it is equally clear of the Tombigbee, Tennessee, and Wabash rivers on the east. Thus, in its course nearly due north and south, it occupies a belt of country almost entirely destitute of natural channels of communication, and forms at the same time the most direct, cheap, and durable trunk line of railway that can be projected for the great valley of the west. In length it is only 11 per cent longer than an air line, with no ascending gradient going south steeper than 30 feet per mile, and none going north over 40 feet per mile; and its highest point of elevation south of the Ohio river, above tide, 505½ feet. Its position for the intersection of other cross or diverging lines of railway is at all points very favorable, to wit: 120 miles from Mobile, in Clark county, Mississippi, it will cross the Vicksburg and Montgomery line; 150 miles from Mobile, in Kamper county, Mississippi, it will receive a branch line from the coal fields of the Black Warrior valley, via Tuscaloosa; which branch may eventually be extended to Huntsville, Alabama. In Tishomingo county, Mississippi, it will connect with the cross line of road from Memphis, Tennessee, through North Alabama to the Georgia railway, at Rome or Chattanooga. By a branch road 23 miles long it will intersect the Tennessee river below the "Great Bend Shoal," 346 miles from Mobile. This branch, extended through Columbia and Nashville, Tennessee, to Louisville or Frankfort, Kentucky, and thence to Cincinnati, forms a connecting line of immense value to the States of Tennessee, Kentucky, Indiana, and Ohio, and to the several railway interests leading from these states to the Atlantic cities. At Columbus, Kentucky, it will receive a branch from the St. Louis and Pacific line, via the Iron Mountain of Madison county, Missouri. About 60 miles east of St. Louis it will intersect the important lines from that city and Alton to Cincinnati and Louisville. Still further north, and half way between the Ohio and Lake Michigan it will cross the very direct easterly line from Springfield, Ill., to Indian-

apolis, Columbus, and Baltimore. At Peru, the southern terminus of the Illinois and Michigan canal, it will branch to Chicago and Galena, to gather the traffic of the lakes and the Upper Mississippi, and finally be extended northward to Lake Superior.

The distances by this road from several important inland towns to the Gulf, as compared with the river channels, may not be without interest, to wit:

Bend of Tennessee river, via railroad.	376 miles.
do. " " via Tennessee and Mississippi rivers	1,456 "
Difference nearer by railroad, in time	
160 hours, and	1,079 "
Memphis, Tennessee, via railroads	461 "
do. " " via Mississippi river	913 "
Difference nearer by railroad, in time	
90 hours, and	452 "
Huntsville, Alabama, via railroads	478 "
do. " " via Tennessee and Mississippi rivers	1,542 "
Difference nearer by railroads, in time	
170 hours, and	1,064 "
Nashville, Tennessee, via railroads	508 "
do. " " via Cumberland and Mississippi rivers	1,641 "
Difference nearer by railroads, in time	
175 hours, and	1,133 "
Mouth of the Ohio river, via railroad	526 "
do. " " via Mississippi river	1,156 "
Difference nearer by railroads, in time	
69 hours, and	630 "
St. Louis, via railroads	700 "
do. " " via Mississippi river	1,366 "
Difference nearer by railroads, in time	
123 hours, and	666 "
Cincinnati, via railroad to Nashville and Mobile	770 "
Cincinnati, via Ohio and Mississippi rivers	1,666 "
Difference nearer by railroads, in time	
168 hours, and	896 "
Chicago, via railroad	900 "
do. " " via Illinois canal and Illinois and Mississippi rivers	1,734 "
Difference nearer by railroads, in time	
171 hours, and	834 "

The total cost of this road, from Chicago to Mobile, 867 miles, constructed with a heavy iron rail, 65 pounds to the yard, and fully stocked with machinery for its opening business, in proportion to the extent and productiveness of the country, will not exceed \$20,000 per mile, or an aggregate of \$17,340,000.

The construction of this road is a matter of importance to every business man in the U. States. It would add hundreds of millions to the aggregate value of the property of the country, and its construction can be secured by the passage of the bill now before the House of Representatives, granting a certain portion of the public lands to its aid—lands that very probably will be of no benefit to the general government if retained, and which certainly can never be productive of so much good to the country as in the manner proposed.

Georgia.

Atlanta and Lagrange Railroad.—We have been favored with a copy of the first annual report of the officers of this road, submitted to the stockholders on the 25th of May last.

One great object of the work is to connect the Georgia railroads with the Montgomery and West Point railroad, which is now in progress, and will

soon be completed to the Chattahoochee river in Alabama. The above link would then open an easy and expeditious route of railroad and steamboat to the gulf, and its construction therefore becomes a matter of interest to every business man and traveller, to say nothing of its importance to those living on its line.

The whole route has been surveyed and located. It has generally a southwesterly direction, passing through the towns of Newnan, in the county of Coweta, and Lagrange, in the county of Troup.

The length of the road is 86 miles, as follows:

From Macon and Western railroad to Newnan	32½ miles.
From Newnan to Lagrange	32½ "
From Lagrange to west bank of river at West Point	15 "

Total length to construct..... 79½ "

Add Macon and Western railroad used. 6½ "

Whole distance..... 86 "

The whole estimated cost of the road, with the equipment, is \$944,000, or about \$11,000 per mile. The rail is to weigh 45 lbs. to the yard, and is to be of the T pattern, this size being adopted from motives of economy. The engines to be used are not to weigh over 35,000 lbs.

The first division of the road, embracing 32½ miles, is now under contract. About one third of the grading and masonry for this distance is completed, and the balance is progressing with rapidity. At the meeting of the stockholders it was expected that the work of laying the superstructure would be commenced on the 15th of July last, and would be completed to the north line of Coweta county before the close of the year; and, it was hoped, to Newnan by the first day of May next.—The grading of the road beyond Newnan has not yet been let, though the engineer recommends that this should be done without delay.

A glance at a map will show the importance of this work, as a part of a great through route between the Atlantic and the States bordering on the Gulf; connecting, as it does, the only road in operation in Alabama, and the railroads in Georgia. Its prospective local business is large, as it will traverse one of the most fertile, thickly settled, and wealthy parts of that State. The estimated net receipts of the different divisions are as follows:

From Atlanta to Newnan	\$39,150
" " Lagrange	69,700

From the road when completed..... 139,500
Equal to 14 per cent. upon its cost. This will strike people as a very large estimate, and is probably much more than will be realised; but as this road occupies a very favorable route, we have a right, from the uniform success of the Georgia railroads, to anticipate for it a good income, sufficient to satisfy a reasonable ambition. In relation to this point the engineer says:

"Increased facilities and comforts, together with decreased time and expenses, will attract to this route a large portion of the travel between New Orleans and the northern cities, which now passes by the western routes. In reference to through travel we need not entertain fears of successful rivalry. On the east, no line of road is now proposed, (of the construction of which there is a reasonable probability,) the design of which is to connect with the great mail route north and south of us, which can obtain any advantage over yours in distance or time. Our position is equally important in reference to the chain of roads which are now being constructed through East Tennessee and Virginia. No line yet proposed on the west, can offer a shorter or quicker communication between the last named chain and the navigable waters of the

Alabama river, than the chain of which your road will form a link.

Our freighting business in dry goods will extend through the heart of Alabama and embrace a portion of Eastern Mississippi, while our return freights will supply Western and Northern Georgia, and East Tennessee, with groceries from the Gulf.

No portion of Georgia, embracing an equal area, is capable of supplying a larger amount of local business, both in travel and freight, than the country immediately tributary to your road; and this can be said of its present population and productions, without anticipating the stimulus which the road will impart to every branch of industry.

These prospects, though flattering, are not delusive. The business of your road is already formed—you have not to wait the development of the resources of a new country before you can give to the stockholders a fair return upon their investment. This fact, when properly understood, will give to the stock a higher and increasing value.

In concluding this report, it affords me pleasure to acknowledge the valuable aid received from my principal assistant, Robert Douglass, Esq., who has had general charge of surveys and construction during the past year. To his good judgment, skill and industry, the company are mainly indebted for the favorable location between Newnan and Lagrange. The assistant engineers, George Hull and C. O. Davis, have also performed their duties with skill and commendable zeal."

J. P. King, of Atlanta, is the President of the company, and L. P. Grant, Chief Engineer.

For the Railroad Journal.

Objections to the Opinion that the Failure of the Iron Bridge on the New York and Erie Railroad was Caused by Expansion.

The Railroad Journal (August 24th, 1850) says:

"The cause of the giving way of the iron bridge on the Erie railroad is believed to be the pressure of the ends of the bridge by expansion from extreme heat, against the abutments. This threw the bridge out of a true line, and of course diminished its strength. Such is the opinion of persons well qualified to judge in these matters."

I must be allowed respectfully to return that bill with objections.

1. The only parts that could be thrown out of a right line by thrusting against the abutments, and have their strength diminished thereby, were, the upper stringers of cast iron, and if these were not actually above the tops of the abutments, they were only between the very topmost courses of stone, which undoubtedly would have yielded sufficiently for any expansion of the metal.

2. It appears like a very improbable supposition, that those stringers were so snugly fitted as not to have had a quarter of an inch space for expansion, when it is notorious that railroad bars of 18 feet are always allowed about one-eighth of an inch for expansion, and what could all the engineers, as well as the contractors, have been about, to have allowed these stringers of 70 feet to be wedged in between abutments without a bit of room for expansion?

3. But not to dwell unnecessarily upon the matter when the thing can be set at rest at once, even supposing those very top courses of stone, held in place only by their own weight, the adhesion of coarse mortar, and the pressure of a few inches depth of earth on the back of the abutments, were absolutely immovable; and that those stringers, for no useful purpose under the sun, were wedged in between these abutments so that they could not expand in length one hair, the admission of all this grand compound of absurdity, would not help the case one atom. For the natural and inherent elasticity of the metal, which it is impossible even to suspect of having been for a moment suspended,

would have accommodated all the effects of expansion without the least injury to the structure.

The cross section of those stringers was about 12 square inches to each, and a load of one ton to the running foot on the bridge, besides the weight of structure, (which the bridge certainly should have been able to bear with safety,) would produce a thrust of about 100,000 lbs. on each stringer at the centre, or say 8,000 lbs. to the square inch—a pressure which would shorten the stringer 3-100 of a foot ($\frac{3}{100}$ of an inch) according to the known elasticity of cast iron; and this amount of compression would accommodate the expansion due to 70 deg. increase of temperature. Therefore, unless the stringers could bear, even confined between two "rocks of ages," an increase of 70° of Fahrenheit, they could not bear the compression due to the load, which every railroad bridge should be able to bear with safety.

This range would extend from the freezing point to 102° which I regard as beyond the extremes of probability in both directions.

I believe, though I cannot vouch for it, that the bridge was erected in moderate weather, a good deal above the freezing point, and that the accident occurred early in the morning, before sunrise, when the thermometer could not have stood above 80°.

Those who will, may endorse the qualifications for judging in such matters, of persons expressing such opinions as those above quoted, as to the failure of the Lackawana bridge. And those who can, may show the absurdity of my explanation and opinion relative to the cause of the same accident, published in the N. Y. Daily Tribune on the 14th August inst.

S. WHIPPLE.

New York.

Albany and Rutland Railroad.—We learn that more than four-fifths of the stock necessary to the completion of this road has been subscribed, and that the remainder will soon be secured.

The road is to be placed under contract as soon as the location and estimates can be completed.—The line is to run through Bennington, and will be about 86 miles long.

The following named gentlemen are the officers of the company:

President—Marcus T. Reynolds, Albany.
Treasurer—James Edwards, "
Secretary—Albert D. Robinson, "

Hudson River Railroad.—The following gentlemen constitute the board of directors of this road for the present year:

James Boorman, Moses H. Grinnell, Gardner G. Howland, John D. Wolfe, Gouverneur Kemble, Edwin D. Morgan, Elisha Peck, Erastus Corning, James Hooker, William C. Redfield, Edward Jones, Charles H. Russell, Drake Mills.

The officers of the board are as follows:

James Boorman, President; Edward Jones, vice president; Wm. C. Young, chief engineer; Oliver H. Lee, superintendent of road in operation; John M. Hopkins, treasurer; George B. Butler, secretary and legal agent.

Ogdensburg Railroad.—The following named gentlemen have been chosen directors of this road for the present year:

T. P. Chandler, J. Wiley Edmunds, R. G. Shaw, B. T. Reed, of Boston; J. Spaulding, president of the Concord railroad; C. Paine, ex-Governor of Vermont; H. Horton, of Malone; J. L. Russell, of Canton; G. N. Seymour, H. Van Rensselaer, of Ogdensburg; G. Redington, of Wadlington; G. J. Floyd, of Champlain; and J. H. Titus, of N. York

city. At a meeting of these directors, T. B. Chandler was unanimously elected president, J. G. Hopkins, of Ogdensburg, secretary; and M. T. Eustis, of Boston, treasurer.

The Buffalo Courier says:—"We hear that the basis of a consolidation of the Attica and Buffalo and Tonawanda railroad companies has been agreed upon, and that no doubt is entertained of its speedy consummation. By the new arrangement a new track is to be constructed from this city to Batavia, on a route nearly straight and almost level, by which the distance is shortened some eight or nine miles, and a proportionate saving made of time."

Railroads in Illinois.

The principal railroads in this State are, 1st, **The Alton and Sangamon Railroad.**—This road, which is to run from Alton to Springfield, the capital of the State, is under contract, and will be pushed rapidly forward to its completion. We believe that the iron for a considerable portion of it has been contracted for.

The Atlantic and Mississippi Railroad.—This road is to extend from Terre Haute to the Mississippi, opposite St. Louis. The company has been organized, and the work of construction is soon to be commenced. From Terre Haute, continuous lines of railroad are in progress to all the great Atlantic cities. The above work will carry them to the Mississippi river, which is now looked upon as the present terminus of all. This work derives great importance from this fact, independent of local considerations, which alone we believe to be a sufficient inducement to warrant its construction. From its importance to other roads, it will be likely to receive important aid from such should it be required; and we think we may put this down as a work which is sure to be constructed within a reasonable time. It is one of those lines that must be constructed for the accommodation of the business and travelling public, and which is necessary to give the full value to the different roads with which it will be connected.

In addition to the above we believe that efforts are making to secure a railroad from Terre Haute to Alton, but we are not well informed as to the progress made in relation to this project.

Rock Island and LaSalle Railroad.—This is a very important line, and is to connect the Illinois canal with the Mississippi at Rock Island, at what are termed the *Lower Falls of the Mississippi*.—This river falls here about 15 feet in a short distance, and the navigation is seriously obstructed at a stage of low water. At the falls the river is separated into two channels by "Rock Island," and this is believed to be the lowest point where it can be bridged at moderate expense, and without injury to navigation. The length of two bridges will be 1800 feet; one 400, and the other 1400. The ledge which makes the fall, extends entirely across the river, and affords the very best foundation for abutments. Rock Island is in the same line of latitude with the southern shores of lakes Michigan and Erie, and of course must be on the line of the great proposed railroad running west. It is also very nearly in the same parallel with Council Bluff, the proposed crossing of the Missouri for a railroad. The Rock Island and LaSalle railroad, therefore, possesses a great importance, from the fact that the line is located by natural features of the country. It occupies the very route that any person unacquainted with the topography of the country would point out as the one best fitted to meet the wants,

and suit the convenience of every section. On reaching LaSalle, the road would be in communication with Chicago, by the Illinois canal. From Chicago a road is now in operation, or will be in a few days to Aurora, on Fox river. From this point to LaSalle the distance is 55 miles, and measures are now in progress to construct this link. The Rock Island and LaSalle railroad company are actively at work, and have already obtained subscriptions nearly sufficient to grade their road. It is one of easiest construction, and can be completed as soon as can the links in the great chain further east. We soon expect to receive the report of the surveys of this road, when we shall again call attention to it.

Chicago and Galena Railroad.—This road is in very successful operation to Elgin, 41 miles from Chicago. The company is preparing to commence the construction of another division of about the same length, extending to Belvidere on Rock river. The portion opened is doing so well, the company will, we presume, find no difficulty in obtaining sufficient means for the vigorous prosecution of the remainder of the line. The success of that part opened must inspire confidence in the ability of the company to meet all liabilities incurred on account of construction.

The Springfield and Meredosia Railroad has been in operation for some time past, but with what success we have not learned. Measures we believe are in progress to push this road to the Mississippi river, which will materially promote its interests. Its want of such a connection, and the general direction of the road, must be serious drawbacks to its usefulness.

The commencement of the *Great Central railroad* is yet in abeyance, depending upon aid from the general government. Should this be granted, it will be commenced immediately, and it would become the parent stem of innumerable branches penetrating every portion of the State. Railroads in Illinois are to become the ordinary means of travel and transportation for the whole population, and no State in the Union, in a few years, will exhibit a more rapid progress than Illinois in these works.

Ohio.

Ohio and Mississippi Railroad.—The new effort which is making to bring this project prominently before the people of Cincinnati again, and to obtain for it the favorable action of our City Council, has the approbation of our most substantial and enterprising merchants and manufacturers.—A large number of our capitalists, some of whom have been lukewarm with reference to the work heretofore, now favor it; and the more enlightened of our mechanics and laborers give their hearty approval.

The new effort contemplates, at every step in the outset, an individual subscription equivalent to what shall at any one time be asked from the corporate authorities. It is proposed, we believe, to ask the City Council to make a loan of the credit of the city to the company, to the amount of \$800,000; (\$200,000 of the million authorized by law having been loaned to the Hillsborough road;) but before this shall be done, individual subscriptions are to be secured, equal to the amount (two, three, or four hundred thousand) which it is proposed to ask at any one time; and the same with reference to future instalments; the money so raised from both sources, to be expended on that section of the road running west from this city.—*Cincinnati Gazette.*

GORHAM'S COMPOSITION, to Remove and Prevent Incrustation (or Scale) in STEAM BOILERS.

THIS valuable composition having been fully and extensively tested, is now offered to the public, as a sure remedy and preventive for incrustations in steam boilers of all descriptions. By its use, all scale is entirely removed from the boilers of Ocean and River Steamers, Locomotive and Stationary Engines, in from 3 to 20 running days, according to the size of the boiler and thickness of the scale. In New Boilers, all incrustation is prevented at a trifling expense. The preservation of the boiler, great economy of fuel and labor, safety, and increased speed, are among the advantages to be derived from the use of this composition.

Orders should state the quality of water used, viz: "Salt," "Fresh," or "Brackish."

For sale, with directions for use, by

W. H. NEWMAN,
75 Pearl street,
New York.

TESTIMONIALS.

New York, August 17, 1850.

We have used Graham's Composition in the boilers of the Steamship Southerner, during several voyages between this place and Charleston. The boilers were old and very foul with scale, a very large quantity of which was removed by the use of the composition, and no new scale was formed.

From our own experience and observation in the use of the article, we are fully satisfied that it will effectually remove the incrustation made by sea water, and also that it will effectually prevent its formation.

We are also satisfied that the use of it will be attended with a great saving of fuel, and that it has no injurious effect upon iron.

DAVID N. MAXON, Engineer,
BERRY, Master,
Steamship Southerner.

Steamship Philadelphia,
New York, August 27, 1850.

I have used "Graham's Composition for Steam Boilers," in the boilers of Steamship Philadelphia, on the voyage to and from Chagres, and am entirely satisfied that it will remove, dissolve and prevent all scale or incrustation in salt water boilers.

For the preservation of the boiler and economy of fuel and labor, I hereby recommend the employment of this composition in the Boilers of Ocean Steamers.

WM. BISBY,
Chief Engineer.

Novelty Iron Works,
New York, July 5, 1850.

We have examined the specimen of Graham's Composition for preventing incrustation of steam boilers, and we believe it may be used with perfect safety in reasonable quantities for the purpose intended, as there does not appear to be any agent in the composition calculated to injure the iron.

STILLMAN, ALLEN & CO.

Piermont, May 20, 1850.

I have used "Graham's Composition," and find it to produce the intended effect; and I hereby, without hesitation, recommend it for Stationary, Marine and Locomotive Engine Boilers.

JOHN BRANDT,
Superintendent Motive Power
New York & Erie R.R.

New York, July 25, 1850.

In answer to many inquiries as to the practical effect of "Graham's Composition," I will state that I have used it in the boiler of the Steamboat Sunssick, which had become considerably incrustated with hard scale from both salt and fresh water. We used 10 lbs. per day, for three days, without blowing off the water, until the fifth day, when all was drawn off. To our astonishment, we found the whole interior of the boiler as clear of scale and smooth as when it came from the hands of the maker. The following week, we tried the same quantity in a small steam tow boat. The boiler had old scale of long accumulation and very thick. We ran the boat three days without blowing off, and on the fourth day washed out the boiler and found it, like the "Sunssick's," perfectly clean and smooth as when new. I am therefore enabled to state that the use of the composition in these two instances under my own immediate observation and direction, has been attended with complete success.

JAMES MORROW,
Engineer Astoria Ferry.

AMERICAN RAILROAD JOURNAL.

Saturday, August 31, 1850.

Panama Railroad.

We are gratified to have it in our power to lay before the public some authentic information respecting this most important work. From the want of publicity hitherto attending the operations of the company, we have been almost induced, along with many others, to entertain many apprehensions that this magnificent enterprise had received a check, in consequence of the very unusual difficulties that must necessarily attend the execution of a work of its magnitude in a country so far removed from the seat of directorship, and in itself affording no facilities whatever for the furtherance of the project; but in making diligent enquiry from the most reliable sources, we are rejoiced to ascertain beyond all doubt, that so far from such being the case, the company are now making arrangements on a large scale, for securing the running of locomotives from Navy Bay to Gorgona by the end of the next dry season. When this is effected, passengers can cross the Isthmus from ocean to ocean between sunrise and sunset.

The accounts of the surveys are already well known. Near the end of the year 1849, the company having determined to enter upon the actual construction of the road, appointed as associate Chief Engineers, Messrs. George M. Totten and John C. Trautwine, both of whom had been employed on several of the most important works in the United States; and had besides become acquainted with the language and manner of working the native laborers of New Granada, during a previous residence of some years in that country, while engaged in the construction of the canal from Carthagena to the Magdalena river.

The operations on the Isthmus have until lately been conducted by Mr. Trautwine, Mr. Totten having been prevented by a prior engagement from giving his personal attention to the work.

The first three months of Mr. Trautwine's residence on the Isthmus were directed to the endeavor to establish Gorgona as a starting point, and depot for the receipt of provisions and materials of construction from the United States, it having been originally the intention of the company to construct the interval between Gorgona and Panama first. The losses, delays and expense of surmounting the impediments of the navigation of the Chagres river, combined with other considerations developed by this attempt to commence at Gorgona, determined the directors to establish their depot, and commence their road, at the Atlantic terminus. The precise point had not been absolutely determined, and Mr. Trautwine devoted his first attention to another careful examination of the coast as far as Porto Bello, which resulted in fixing it at Manzanilla Island, the same point contemplated under Col Hughes' survey. The island was at the time covered with a dense growth of trees, shrubs and vines, which had to be cleared away before habitations for laborers could be erected upon it, and no preparations having been made to commence at this point, the engineers and men were obliged to live on board a brig which arrived with materials for houses, and on the hull of the steamer Telegraph, which Mr. Trautwine happened to be able to purchase at Chagres, until the island could be sufficiently cleared and houses erected. Until these difficulties were removed, Mr. Trautwine was unwilling to receive laborers en-

gaged by Mr. Totten in Carthagena; but these are now at an end; a large storehouse is erected for provisions and materials; the other buildings are in progress, and Mr. Totten is on the spot with a force of about 200 men, fixing definitely the location, and clearing the line of the road; while Mr. Trautwine is now in this country with full knowledge of the whole condition of things on the Isthmus, to return the early part of next month, completing all the arrangements that may be required to secure the running of locomotives from the Atlantic to Gorgona, by the end of the next dry season.

With the view of expediting the work the road is to be built temporarily, (wherever the surface of the ground will permit), upon piles instead of embankments. The piles are to be sent from this country, cut to the requisite dimensions, and pointed for driving. Six steam pile drivers will be sent out to different points on the line of the road, and all the preparatory work possible will be done here, so as to save labor on the Isthmus; while to meet such as is indispensable there, arrangements have been made with the Royal West Indian Mail Steam Packet Company, at a low rate, for carrying to the Isthmus a large force of native laborers, from Carthagena, and the interior provinces. Negroes are to be brought over from Jamaica; a body of white men has already gone down from New Orleans, and to guard against all risk of failure, advantage will be taken of the California excitement to carry to the Isthmus a large force from this country, under a special contract, the basis of which is a passage to California. The cross ties, pile drivers, and other materials are already purchased, four locomotives are to be built as soon as the contract can be made; and a contract has been closed with the "American Timber Preserving Company" of this city for submitting all the piles, cross-ties and other timber, to the preservative process of "Payne-izing," with the view of protecting it from decay, and the ravages of worms. The transportation of men and materials between Navy Bay and the different stations on the Chagres river, will be under the charge of Capt. Chapman, who has been for some years engaged in running a steamer with native labor on the Magdalena, and who will have in his employ a body of picked boatmen from that river, while to furnish immediate facilities for travellers, an arrangement has been made with Mr. A. G. Jewett of Maine, under which Mr. Jewett will have two small steamers and a full complement of small boats for transportation to Gorgona.

The opening of the railroad to Gorgona will of course afford great facilities for the further prosecution of the work, and it is confidently believed that by the end of the dry season of 1852, a temporary railroad will be completed to Panama, ready to transport passengers with their luggage and light freight from ocean to ocean in not exceeding six hours. The perfecting of the work can then be carried on at leisure.

Details of construction (as all the particulars of a road to connect the two oceans are interesting) will be given in a subsequent number; in the meantime we are happy to find on inquiry that, although silent, the company is not idle; and, with the view of answering questions on this subject we publish the present organization of the company, which we observe is much the same as at its commencement, with the exception that Mr. Ludlow, who had consented to hold the office during Mr. Stephens absence in New Granada on the business

of the company, has resigned as president, and Mr. Stephens has been elected in his place.

BOARD OF DIRECTORS.

JOHN L. STEPHENS, President.

William H. Aspinwall,	Thomas W. Ludlow,
Henry Chauncey,	David Thompson,
James Brown,	Joseph B. Varnum,
Cornelius W. Lawrence,	Samuel S. Howland,
Gouverneur Kemble,	Edwin Bartlett,
S. B. Ruggles,	E. J. Woolsey.
Francis Spies, Secretary.	
Horatio Allen, Consulting Engineer.	
Geo. M. Totten,	} Associate Engineers in
John C. Trautwine,	
} Chief.	
James L. Baldwin, Principal Assist. Engineer.	

Railroad Securities.

There is no more equitable way to obtain means to build a railroad, than for a town or county interested in its construction to pledge its collected credit for the money to be hired. People are benefitted by these works in proportion to the property they possess. It is right that they bear the burden in the same ratio.

Credits based upon the guaranty of towns and counties are regarded with favor in this market; but to render them available, they must be based upon the concurrence of a very large proportion of the population. The opposition of a large and clamorous minority can defeat a loan just as effectually as if it were in a majority. Monied men are not going to lend their money when any question can arise as to the goodness of the security, or the disposition of those receiving it to repay it.—This minority may soon become a majority, and repudiate the debt altogether.

Money is abundant, and can be had upon reasonable terms upon undoubted security; and if our western friends want it, they must come with united hands. A portion, or a faction, cannot get it.—We say this for the purpose of putting people right in this matter, and of letting them know how they can come into this market with certainty of success. If they get into a quarrel at home about giving their credit, they had better stay at home after it is voted.

Iron Manufacture in New England.

We have received the memorial of the iron manufacturers of New England to Congress, praying for additional protection to this article.

This branch of our domestic industry is very much depressed in New England and New York, and we think additional duty would not materially help those engaged in turning out the raw material. We have long believed that the furnaces of this section could not stand the competition of those of Pennsylvania, which enjoy such superior means of making a cheap article. With anthracite and ore side by side, the Pennsylvania iron maker can undersell, by many dollars on the ton, the northern and eastern manufacturer who uses a much more costly fuel, and who is compelled frequently to transport his ore for a considerable distance. For the better kinds of iron we may still be obliged to resort to our charcoal furnaces, and for such, increased duty is almost indispensable; but those making an ordinary iron had better shut up shop and go to those districts where coal and iron are found together—where all the elements of cheap production exist in the same vicinity, and in inexhaustible abundance. With any amount of duty, many of the northern furnaces would soon be compelled to yield to the superior advantages of other parts of the country. This fact should receive the

attention of these iron makers, as well as the question of protection from the foreign article.

In another number we shall give the substance of the memorial.

To Railroad Companies and Mechanical Establishments.

A Person of considerable experience and practical knowledge in Mechanical, Civil and Marine Engineering, is anxious to meet with an engagement with either a Private Individual or Public Company, who may have works either to design or execute in the above branches of the Engineering Profession.

Address Z. Y., 47 Atlantic st., South Brooklyn, L.I.

Maine.

European and North American Railroad Co.—The Legislature of Maine have incorporated, under the above title, a company to build that part of the line running through that State, and have appropriated \$5,000 for a survey of the route. This is a good beginning, and will we trust be vigorously followed up by the future action of the company.

The city of Portland has, by a vote of 1088 to 111, loaned its credit to the Atlantic and St. Lawrence railroad for an additional sum of \$500,000, making \$1,500,000 in the whole.

Pensacola and Columbus Railroad.

We see it stated in the Florida papers that this project is again to be started in such a manner as to give assurance of success.

Stirling's Patent Cast Iron.

Our readers will do well to look at the article upon this subject in our present paper.

Ohio.

Cleveland, Sandusky and Toledo Railroad.—A spirited railroad meeting was held at Elyria, day before yesterday. Delegations from Oberlin, Norwalk, Milan, Sandusky, Bellevue, Fremont and other places were present, to represent the different interests and the advantages of the various lines travelled. After hearing the claims of all, and carefully weighing the whole matter, the Directors of the Junction railroad company decided to locate the road commencing at a point on the Cleveland and Columbus road, about fifteen miles west of Cleveland, through Elyria, thence by the most feasible route to Sandusky; and from there to Fremont, provided the citizens of that place raise a given amount of subscription, and thence to Toledo.

By this arrangement the Western road will lay their track for the first fifteen miles out of Cleveland beside the track of the Cleveland and Cincinnati road. And we understand that this arrangement will be carried out unless some superior inducements are offered for carrying the road into Ohio City.

Subscriptions to an amount nearly sufficient to grade and bridge the road from Cleveland to Sandusky are already provided, and the executive committee, consisting of Judge Lane, and Alexander Porter, of Sandusky, Dr. DeWitt, of Elyria, and H. B. Ely, of Cleveland, are instructed to put the whole road under contract at the earliest practicable period.

There is every indication that the work will be pushed forward vigorously, until the whole is completed.—*Cleveland Herald.*

Sale of State Railway.

The Canal Commissioners of this State have given notice that sealed proposals for the sale of that portion of the Columbia railroad, from the eastern end of the Schuylkill Inclined Plane, in-

cluding the Schuylkill viaduct, to the corner of Vine and Broad streets, Philadelphia, will be received until Thursday, the tenth of October. The local trade on this portion of the road, it is stated, is annually on the increase. The tolls received in 1849 from the Reading railroad company, and from the local trade and travel between the plane and the city, amounted to \$24,443.

Illinois.

This State has now pretty well recovered from the embarrassments into which her extravagant and reckless expenditure of money, upon public works, commencing in 1836, plunged her; and with the experience of the past, she is again commencing their construction upon a basis which gives every prospect of success.

The immense sums lost by some of the Western States in their attempts at internal improvements, and the failure, in consequence, of some of them to meet their liabilities have led monied men to look with distrust upon western securities; to reject them as altogether worthless, this class of men following, (as they usually do), in the wake of the public sentiment, delirious with excitement in 1836 and 1837 were then the most eager for these securities, when ordinary prudence and foresight would have dictated an entirely different course.

When the public works of Illinois were projected and commenced, all the conditions of success were wanting. Time was necessary to create them. She had no trade, no accumulated property, and only a very scattered population, numbering less than 300,000. She had no trade, neither financial, mechanical, nor engineering skill nor experience to successfully superintend and carry out these works. It is very easy now to see that failure then was inevitable. Railroads are merely the instruments of commerce and transportation, and where neither commerce nor people exist, their success is impossible. In many parts of Illinois lines of great extent, which were graded in 1837, are now covered with dense forests, so that the track can hardly be distinguished from the surrounding country. The whole of the stupendous system then planned, has been utterly abandoned. The people of the State became so disgusted with the policy which had been pursued, that they changed their constitution, and forbade the State engaging for the future in her corporate capacity in such works. But the increase of population and business having rendered railroad matters of necessity, the old abandoned lines, upon which much work had been done, have been in many instances purchased by individuals, and their completion is in progress on private account. Since these works were commenced Illinois has more than trebled her population. She has now what she then lacked—population, wealth, skill, experience—all the elements necessary to success. To judge of the present from the past is reasoning from entirely different data. There is no parallelism between the two periods. Repudiation in Illinois was the result of necessity. Those who loaned her money ought to have foreseen this. They took the risk, and if it turned out unfortunate, they must thank themselves for their folly. With her increased strength she will soon resume the payment of her liabilities, and time is only wanting to give her securities as high a value in the market as those of Ohio.

Railroad companies in Illinois are as much entitled to credit as those of Ohio, provided they can make out as good a case, as far as means and pro-

pective business are concerned. The liabilities of Chicago are just as certain to be met as those of Cleveland. So with the other towns and counties in that State. Among her people there is no more disposition to repudiate than among those of Ohio or New York. In extending credits to the former the point to be considered is their ability not their disposition to pay. If the former point is satisfactorily made out, the latter will follow as a matter of course.

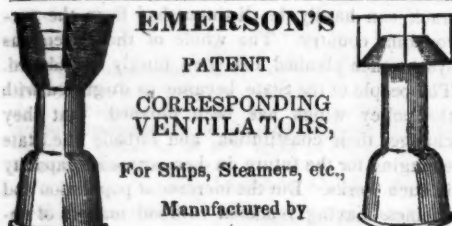
Illinois has now a population of 1,000,000. She equals any State in the Union in the extent of her resources, and as she is one of the largest in area, we think that she will eventually become the most populous. No interior State has such commercial advantages as this. None has so large a quantity of fertile soil, and none such a vast extent of coal fields. With all these elements of wealth why should not her public works attract attention, and receive the patronage and support of other parts of the country? We are confident that none are more deserving, and that none are more certain to yield a rich return upon the money invested in them.

Notice to Contractors.

COVINGTON & LEXINGTON RAILROAD.
Sealed Proposals will be received at the office of the Covington and Lexington Railroad Company, in the city of Covington, until the 10th day of September next, for grading twenty miles of the Covington and Lexington Railroad, commencing at Covington and extending up the valley of the Licking river. The proposals will include all the excavations, embankments, and masonry for culverts—also the masonry for bridges.

Plans and specifications of the work to be done, and the terms of payment, may be seen at the office of the company, at any time between the first and tenth of September.

SYLVESTER WELCH,
Engineer Covington and Lexington R. R.
Covington and Lexington Railroad Office,
July 21st, 1850.



EMERSON'S
PATENT
CORRESPONDING
VENTILATORS,
For Ships, Steamers, etc.,
Manufactured by
CHILSON, ALLEN, WALKER & CO.,
351 Broadway, New York.

Notice to Contractors.

SEALED PROPOSALS will be received at the office of the James River and Kanawha Company in Richmond, until the 1st day of October next, for the construction of the Piers and Abutments of the Bridges across James River at New Canton, Hardwickville and Bent Creek. This work will be paid for in cash. Besides the usual reservation of 20 per cent. on the monthly estimates, the contractor or contractors will be required to give ample security, satisfactory to the Board of Directors, for the completion of the work at the time and in the manner specified in the contracts.

Plans of the above works will be exhibited and specifications thereof delivered to the contractors at the office of John Conly, the Assistant Engineer in charge of the same in Columbia.

WALTER GWYNN,
Chief Eng. J. R. & K. Co.

August 16, 1850.

CUT NAILS OF BEST QUALITY, BAR IRON
(including Flat Rails) manufactured and for sale by
FISHER, MORGAN & CO.,
75 N. Water St., Philadelphia.

Great American Engineering

AND MECHANICAL WORK, just published in a medium folio One Dollar, 75 cts. to Subscribers. Part VII of "Specimens of the Stone, Iron & Wood Bridges, Viaducts, Tunnels, Culverts, &c., &c., of the United States Railroads." By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections and details of the elegant timber Bridge, (Burr's Patent,) 150 feet span, across Salmon River, Malone, on the line of the Northern-Ogdensburg-railroad, and isometrical views of Bridges 30, 40, 60, 82 and 88 feet span on the line of the Utica and Syracuse railroad, with specifications, form of contract, &c., &c., for the Connecticut River railroad.

"It is a work that was a great desideratum, and must prove of great benefit to the engineering profession generally, and especially to the tyro in practical engineering and mechanical knowledge; in truth it strikes us, that it would require years of labor and patient toil on the part of a young engineer to prepare the drawings, and collect the information that will be embodied in this work, and can now be secured for the trifling sum of \$9."—[Scientific Amer. March 16, 1850.]

In connection with this subject (Iron Railroad Structures) we take occasion to call attention again to Mr. Duggan's valuable and expensive publication, exhibiting drawings, with full descriptions of the various stone, iron and wooden bridges, viaducts, tunnels, culverts, &c., of all the Railroads in the United States. Mr. Duggan is an accomplished Architect and Civil Engineer, who came from Ireland to it is country to exercise his profession; but finding Railroad construction here, in many respects, different from that he had been accustomed to in Europe, he applied himself to the study of our system; and the fruits of his researches and investigations embodied in this work, are well calculated to meet the exigencies of engineers, and to assist draughtsmen, bridge builders, mechanics and students.—[N. Y. Journal of Commerce, Feb. 14, 1850.]

Published by **GEORGE DUGGAN,**
300 Broadway, New York.

To whom all communications should be addressed, and subscriptions forwarded.

Gloucester Iron Works, GLOUCESTER, NEW JERSEY, NEARLY OPPOSITE PHILADELPHIA.

THE subscribers having made extensive alterations in their works, are now prepared to receive orders for all kinds of Stationary and Marine Engines, Boilers, Locomotives, Sugar Mills, and every description of Mill Work.

Also—Orders for Iron and Brass Castings executed with despatch.

Having secured the valuable services of Mr. David Matthew as Superintendent (who has been for five years foreman in the Iron Works of John Watchman, now the Vulcan Works, Baltimore, and for 12 years superintendent of the Mohawk and Hudson and the Utica and Schenectady Railroads, New York,) they feel confident that all orders entrusted to them will be faithfully executed.

Having an extensive Wharf in front of their works, it will afford a safe harbor for all classes of steam vessels that may require repairs during the winter.

C. M. & J. C. SITER.
Gloucester, July 24, 1850. 1m.

Rosendale Cement.

THE NEWARK AND ROSENDALE LIME AND CEMENT CO. are now manufacturing at their works in NEWARK, N. J., and Ulster county, N. Y., a very superior article of *Hydraulic Cement*—also Lime Calcine Plaster, etc. Contractors and dealers will find it to their advantage to call or make application before purchasing elsewhere. All communications addressed to the subscriber, at Newark, N. J., will be punctually attended to.

ly*15 HENRY WILDE, Secretary.

MINING AGENCY.

Capt. O. H. Matthews,

Civil and Mining Engineer, F. G. S., London, etc. HAVING completed his three years engagement on Lake Superior, is open to negotiate for another appointment as Mining Agent, or Superintendent of Mines. Also, to give his opinion and advice upon Mineral Lands, to Buyers and Sellers of Stock, or to be consulted on any section in this important branch of national industry.

The most implicit confidence may be relied on, and immediate attention given to all communications (pre paid). Address Capt. O. H. Matthews, Toronto, July 27th, 1850. 3m

Great Work on Bridge Building, etc., etc.

JUST published in medium folio, One Dollar, 75 cts. to subscribers.

Part I. of a "THEORETICAL AND PRACTICAL TREATISE ON THE CONSTRUCTION OF BRIDGES IN STONE, IRON AND WOOD," By George Duggan, Architect and Civil Engineer.

The present part contains beautifully executed plans, elevations, sections, and centering, of the Bridge of St. Malxence, France, by M. Perronet, the eminent Architect and Engineer, and plans, elevations, sections, and details of the oblique Timber Bridge, 700 ft. long, constructed for a double track across the River Tyne, on the line of the Newcastle and Carlisle railroad, by John Blackmore, C. E., with an introductory article on the relative merits of the various materials employed in the construction of Bridges, as regards economy, strength and durability, and critical remarks on the various forms of bridges designed and constructed by the most eminent architects and engineers in Europe and America.

"PART VI. of Specimens of the Stone, Iron and Wood Bridges, etc., etc., of the United States Railroads," By George Duggan, Architect and Civil Engineer, contains specimens of the plates and letter press intended for the APPENDIX, being the commencement of a complete Treatise on the Theory and Practice of Bridge Building. This will be one of the most valuable works on the subject ever presented to the attention of engineers in this country—condensing the most important information on this branch of architecture contained in the writings of the most eminent scientific men in the French, German, Italian, and English languages, in the course of the last and present century. It will be illustrated by numerous accurate representations of bridges of the greatest celebrity in modern times. Elaborate articles will be given on the strength, property, and uses of the different materials employed, and on the most approved methods of constructing Cofferdams, Foundations, Centering, etc., with descriptions and drawings of the various engines and Machines that were found most useful in constructing the works, and a selection of such specifications as may be of service to the practical bridge builder. The sixth number treats of the Application of Iron to Railroad Structures, and is illustrated by beautiful drawings of the Bridge across the Delaware at Saw Mill Rift on the Erie Railroad, and of the bridge over Fairfield street, on the Manchester and Birmingham Railroad. The great success of this work thus far is the best tribute to its scientific merit and its adaptation to the wants of the American engineer."—[New York Daily Tribune, June 23, 1850.]

Published by George Duggan, 300 Broadway, New York, to whom all communications should be addressed and subscriptions forwarded.

Parties remitting Mr. Duggan \$5. and the remainder \$4 when they have been supplied with the first six parts of the "Theoretical and Practical Treatise on Bridge Building, etc., etc." shall receive it monthly as published. To those making Mr. Duggan a present remittance of \$9, the work will be forwarded post free to any part of the United States.

American Railway Guide, AND POCKET COMPANION FOR THE UNITED STATES;

CONTAINING Correct Tables, showing the time for starting of trains from all stations, distances, fares, etc., on all the Railway lines in the U. States; also many of the principal Steamboat and Stage routes—accompanied by a complete RAILWAY MAP. Price, single copies 12½ cts., or \$1 per annum. Published on the first of every month, corrected from returns furnished by the Railway Superintendents throughout the Union.

This book has been compiled somewhat on the plan of Bradshaw's Guide, with such improvements in size, form and arrangement as have seemed desirable; and the publisher confidently hopes it will not be found liable to the objections of incompleteness and incorrectness, which have been made, and justly too, against various other similar works heretofore issued.

The subscriber having had the management of the NEW YORK PATHFINDER almost from its commencement, has enjoyed superior facilities in obtaining information relating to the thoroughfares of travel, and is therefore well qualified to prosecute with success the arduous undertaking of furnishing a complete and correct national guide book.

STRINGER & TOWNSEND, General Agents, 222 Broadway: and sold also by Booksellers and Periodical Dealers generally throughout the country; also on all the Railways and Steamboats.

CURRAN DINSMORE, Publisher.
N. Y. Pathfinder Office,
139 Fulton St., New York City.

Fagotted Car and Engine Axles

FORGED by RANSTEAD, DEARBORN & Co., Boston, Mass.
These Axles enjoy the highest reputation for excellence, and are all warranted.

Ogden & Martin's ROSENDALE CEMENT.

WE are prepared to enter into arrangements for supplying our Cement for public works or other purposes. We warrant the cement equal in every respect to any manufactured in this country. It attains a great degree of hardness, sets immediately under water, and is a superior article for masonry coming in contact with water, or requiring great strength.

For sale in tight barrels, well papered, at their office by
OGDEN & MARTIN, 104 Wall st.
February 16, 1860.

The above cement is used in most of the fortifications building by government.

Railroad and Mathematical Instruments.

KUNS & BASELER, Mathematical Instrument makers, manufacture and keep for sale all kinds of mathematical instruments: also drawing instruments, scales and balances for the use of chemists, professional gentlemen, jewellers, etc., etc., of the most perfect description, at the lowest price, at 81 Nassau street, New York.

Ibbotson, Brothers & Co's CELEBRATED CAST STEEL

AND
Best Cast Steel Royal Improved Files, well known as better adapted for Engineers' and Machinists' purposes than any now in use in the United States.

Every description of Square, Octagon, Flat and Round Cast Steel, Sheet, Shovel and Railway Spring Steel, etc., and Steel to order for any purposes—manufactured at their works in Sheffield—and universally known by the old stamp "Globe."

HENRY J. IBBOTSON, Agent,
218 Pearl st., New York.

Railroad Iron.

OF ANY PATTERN AND WEIGHT,
Of a Favorite Brand,
And deliverable in Bond, or Duty paid, at any Port of the U. S., contracted for on favorable terms, by

CHARLES ILLIUS,
20 Beaver St., New York.

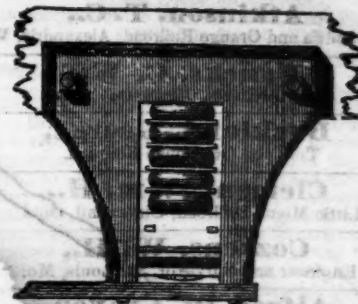
Pig and other Iron also contracted for. Sole Agent for "Baxter's Machine and Burning Oil"—particularly adapted for "Railroads" and other Machinery—Preferred to Sperrin by the many now using it, and 25 per cent. cheaper.

Coal.

CUMBERLAND SEMI-BITUMINOUS COAL
superior quality for Locomotives, for sale by

H. B. TEBBETTS,
No. 40 Wall St., New York.

May 12, 1849.

FULLER'S PATENT INDIA RUBBER SPRING.

THESE SPRINGS ARE THE CHEAPEST, the lightest and most durable of any yet known. They are easily applied to new or old cars, and there is small possibility of any accident occurring to them. Other parties through Mr. Ray set up claims to an India Rubber Spring which, though the same in principle, is very inferior in its working and durability. Actions are in progress for an Infringement on Fuller's Patent against parties using that Spring.

The superiority of Fuller's Spring over that claimed by Mr. Ray is fully established and has frequently been testified to. The following are from gentlemen who have had much experience with both Springs.

"It will afford me pleasure to recommend your springs to the companies in this region, in preference to Ray's which I am confident are inferior in mechanical arrangement to yours."
JOHN M'RAE,
Engineer S. Carolina R. R., Charleston.

"I do not hesitate to allow you to say that I concur in Mr. M'RAE's opinion that Ray's springs are inferior in mechanical arrangement to Fuller's. I repeatedly expressed that opinion long before Mr. M'RAE had seen your springs (as I believe) and entertain it still."
WM. PARKER,
Gen'l Supt. of Baltimore and Ohio R. R.

Office of Sup't Norwich & Worcester R.R. Co.,
December 26, 1849.

"I most fully concur in the opinion of Jno. McRAE, Engineer of S. Carolina Railroad, that 'Rays Springs' are inferior to Fuller's Springs; and shall with pleasure recommend them to all Railroad Companies for adoption. I have used both springs on this road and have no hesitation in saying that I should in all cases prefer Fuller's Spring."

SAM'L H. P. LEE, JR.,
Supt and Engineer.

Office B. & P. R. R. Co.,
Boston, 20th December, 1849.

"This company have cars fitted up with both Ray's and Fuller's 'Metallic India Rubber Springs,' and do not hesitate to say that Fuller's arrangement very much superior to Ray's."

W. RAYMOND LEE, Supt.

The following result has been obtained by experiment upon one railroad.
A set of Trucks fitted
with Steel Springs cost \$190.77 and weigh 2355 lbs.
The same with Fuller's
Springs, 131.71 1911 lbs.

Difference, \$59.06 444 lbs.

Not only is there an advantage in the cost, but owing to the great reduction in weight, the car can be made lighter throughout, and so an enormous saving in weight may be effected in a Train.

AGENTS.

G. M. KNEVITT, 39 Broadway, N. Y.,
JOHN THORNLEY, 110 Chestnut St., Philad.
The **BOSTON BELTING CO.**, Milk st., Boston.
January 2, 1850.

American Cast Steel.

THE ADIRONDAC STEEL MANUFACTURING CO. is now producing, from American iron, at their works at Jersey City, N.J., Cast Steel of extraordinary quality, and is prepared to supply orders for the same at prices below that of the imported article of like quality. Consumers will find it to their interest to give this a trial. Orders for all sizes of hammered cast steel, directed as above, will meet with prompt attention.

May 28, 1849.

**To Merchants, Railroad Companies, Machinists and Boiler Makers.**

THE subscribers beg leave to call attention to their very large stock of Iron and Steel—of American, English, Swede and Norway make—of all the different kinds in use. Also, Railroad Iron, Ship, Boat and Railroad Spike. They are also Agents for the Best Pennsylvania Locomotive Boiler and Tank Iron, each sheet of which will be stamped and warranted, at lowest mill prices. Our prices for all kinds of iron will be found very low, either for cash or approved credit.

BRINK & DURBIN, Philadelphia.

ENGINEERS.

Atkinson, T. C.,
Alexandria and Orange Railroad, Alexandria, Va.

Bancks, C. W.,
Civil Engineer, Vicksburg, Miss.

Buckland, George,
Troy and Greenbush Railroad.

Clement, Wm. H.,
Little Miami Railroad, Cincinnati, Ohio.

Cozzens, W. H.,
Engineer and Surveyor, St. Louis, Mo.

Alfred W. Craven,
Chief Engineer Croton Aqueduct, New York.

Davidson, M. O.,
Eckhart Mines, Alleghany Co., Maryland.

Fisk, Charles B.,
Cumberland and Ohio Canal, Washington, D. C.

Felton, S. M.,
Fitchburg Railroad, Boston, Mass.

Floyd-Jones, Charles,
South Oyster Bay, L. I.

Gzowski, Mr.,
St. Lawrence & Atlantic Railroad, Montreal, Canada.

Gilbert, Wm. B.,
Rutland and Burlington Railroad, Rutland, Vt.

Grant, James H.,
Nashville and Chattanooga R. R., Nashville, Tenn.

S. W. Hill,
Mining Engineer and Surveyor, Eagle River,
Lake Superior.

Hewson, M. Butt,
Memphis, Tenn.

Holcomb, F. P.
Southwestern Railroad, Macon, Ga.

Johnson, Edwin F.
New York and Boston Railroad, Middletown Ct.

Latrobe, B. H.,
Baltimore and Ohio Railroad, Baltimore, Md.

Miller, J. F.,
Worcester and Nashua Railroad, Worcester, Mass.

Morris, Elwood,
Schuylkill Navigation, Schuylkill Haven, Pa.

Morton, A. C.,
Atlantic and St. Lawrence Railroad, Portland, Me.

McRae, John,
South Carolina Railroad, Charleston, S. C.

Nott, Samuel,
Lawrence and Manchester Railroad, Boston.

Prichard, M. B.,
East Tennessee and Georgia R. R., Cleveland, Tenn.

Roebbling, John A.,
Trenton, N. J.

W. Milnor Roberts,
Bellefontaine and Indiana Railroad, Marion, Ohio.

Roberts, Solomon W.,
Ohio and Pennsylvania Railroad, Pittsburgh, Pa.

Sanford, C. O.,
South Side Railroad, Virginia.

Schlatter, Charles L.,
Northern Railroad (Ogdensburg), Malone, N. Y.

Sours, Peter,
Rahway, New Jersey.

Stark, George.,
Bost., Con. and Mont. R. R., Meredith Bridge, N. H.

Steele, J. Dutton,
Pottstown, Pa.

Trautwine, John C.,
Panama Railroad—Address through office of Panama
Railroad Co., 78 Broadway, N. Y.

Trimble, Isaac R.,
Philad., Wil. & Baltimore Railroad, Wilmington, Del.

Tinkham, A. W.,
United States Fort, Bucksport, Me.

Thomson, J. Edgar.,
Pennsylvania (Central) Railroad, Philadelphia.

Troost, Lewis,
Alabama and Tennessee Railroad, Selma, Ala.

Whipple, S.,
Civil Engineer and Bridge Builder, Utica, N. Y.

Williams, E. P.,
Auburn and Schenectady Railroad, Auburn, N. Y.

Williams, Charles H.,
Milwaukee, Wisconsin.

HOTELS.

Exchange Hotel,
Adjoining Eastern Railroad Depot,
BUFFALO, N. Y.
BY.....**FISK & SPERRY,**
Late of Delevan House, Albany.

J. D. Abraham, Architect,
NO. 300 MAIN STREET,
BUFFALO, N. Y.

Fountain Hotel,
LIGHT STREET, BALTIMORE,
P. THURSTON.....Proprietor.

DUNLAP'S HOTEL,
On the European Plan,
NO. 135 FULTON STREET,
Between Broadway and Nassau St.,
NEW YORK.

MANSION,
Corner of Maine and Exchange Streets,
P. DORSHIMER.....BUFFALO.

GUYS
United States Hotel,
(Opposite Pratt street Railroad Depot.)
BALTIMORE.
JOHN GUY.....WILLIAM GUY.

American Hotel,
Pratt street, opposite the Railroad Depot,
BALTIMORE.
HENRY M. SMITH.....Proprietor.
Late of the Exchange & St. Charles Hotels, Pittsburg.

Washington Hotel,
BY JOHN GILMAN,
\$1 Per Day.
No. 206 Pratt street, (near the Depot.)
BALTIMORE.

Barnum's City Hotel,
MONUMENT SQUARE, BALTIMORE.
This Extensive Establishment, erected expressly
for a Hotel, with every regard to comfort and conven-
ience, is situated in the centre and most fashionable
part of the city, and but a few minutes' walk from the
Railroad Depots and Steamboat Landings.
The House has lately undergone a thorough repair,
embracing many valuable improvements, and will ac-
commodate 250 Guests. BARNUM & CO.

JONES' HOTEL,
NO. 152 CHESTNUT STREET,
PHILADELPHIA.
BRIDGES & West, Proprietors.

BUSINESS CARDS.

Lithography.
JOHN P. HALL & CO.,
161 Main st., Buffalo, (Commercial Advertiser Build.)
Are prepared to execute all kinds of Lithography
in good style and at reasonable rates. Particular at-
tention will be paid to Engraving Railroad Maps, En-
gineer's Plans and drafts, etc., and orders in this line
are respectfully solicited.

J. T. Hodge
Will attend to the examination of mining tracts near
Lake Superior, and prepare Reports and Maps.
Address, during the Summer,
[Ontanagon Postoffice, Lake Superior.

Cumberland Steam Coal,
FROM THE
FROSTBURG MINES, MD.
H. A. TUCKER,
Agent of Frostburg Coal Co.
No. 50 Wall Street, New York.

Eaton, Gilbert & Co.,
Railroad Car, Coach and Omnibus Builders,
TROY, N. Y.

Nathan Caswell,
METAL BROKER, 69 WALL ST., N.Y.
For the Purchase and Sale of Railroad Iron (new and
old,) Boiler Plates, Pig and Bar Iron, Lead, Tin, Cop-
per, Spelter, etc. Refers to
Messrs. Boorman, Johnston, & Co., New York.
" Grinnell, Minturn & Co., "
" Barston, Pope & Co., "
" Earps & Brink, Philadelphia.
" E. Pratt & Brother, Baltimore.
John Barstow, Esq., Providence.
Lewis Bullard, Esq., Boston.
February 9, 1850. 6m*

**United States Railroad Guide
and Steamboat Journal.**
CONTAINING OFFICIAL TIME ADVERTISEMENTS,
Tables of Stations, Distances, Fares, Time, etc.,
with much miscellaneous matter for the travelling pub-
lic. Price 12 cents a copy. Yearly subscription \$1.
Published at 43 Ann street, New York.

STEEL AND FILES.
R. S. Stenton,
20 CLIFF STREET, NEW YORK,
AGENT FOR
J. & Riley Carr's
BAILEY-LANE WORKS, SHEFFIELD,
Manufacturers of Cast, Shear, German and Blister
STEEL
Of all descriptions. Warranted Good
FILES.
Manufacturers of Machinists' Warranted Best Cast
Steel Files, expressly for working upon Iron and Steel,
made very heavy for recutting.
A full Stock of Steel and Files at all times on
hand. 6m4

Walter R. Johnson,
CIVIL AND MINING ENGINEER AND AT-
torney for Patents. Office and Laboratory, F St.,
opposite the Patent office, Washington, D. C.

Dudley B. Fuller & Co.,
IRON COMMISSION MERCHANTS,
No. 139 GREENWICH STREET,
NEW YORK.

Manning & Lee,
GENERAL COMMISSION MERCHANTS,
NO. 51 EXCHANGE PLACE,
BALTIMORE.
Agents for Avalon Railroad Iron and Nail Works.
Maryland Mining Company's Cumberland Coal 'CED'
—'Potomac' and other good brands of Pig Iron.

Cop Waste.
CLEAN COP WASTE, suitable for cleaning Rail-
road, Steamboat and Stationary Engines, con-
stantly on hand and for sale by
KENNEDY & GELSTON,
54 Pine St., New York.
October 27, 1849, 3m

Plushes for Railway Cars, Omnibuses, etc.**F. S. & S. A. MARTINE,**
112 WILLIAM ST., NEAR JOHN.

ARE now receiving a large and complete assortment of Plain and Figured PLUSHES, of their own importation, which will be sold at the lowest market price, viz: Crimson, Maroon, Scarlet, Green, Blue, Purple, etc.

ALSO—CURLED HAIR, the best manufactured in market.

Samuel Kimber & Co., COMMISSION MERCHANTS
WILLOW ST. WHARVES, PHILADELPHIA.

AGENTS for the sale of Charcoal and Anthracite Pig Iron, Hammered Railroad Car and Locomotive Axles, Force Pumps of the most approved construction for Railroad Water Stations and Hydraulic Rams, etc., etc.

July, 27, 1849.

James Herron, Civil Engineer,
OF THE UNITED STATES NAVY YARD,
PENSACOLA, FLORIDA.

PATENTEE OF THE

HERRON RAILWAY TRACK.

Models of this Track, on the most improved plans, may be seen at the Engineer's office of the New York and Erie Railroad.

To Railroad Companies.

—WROUGHT IRON WHEELS—
SAFETY AND ECONOMY.

NORRIS' LOCOMOTIVE WORKS,
SCHENECTADY, NEW YORK.

Are Manufacturing Wrought Iron Driving, Truck, Tender, and Car Wheels—made from the best American Iron. Address E. S. NORRIS.
May 16, 1849.

Manufacture of Patent Wire ROPE AND CABLES,

For Inclined Planes, Suspension Bridges, Standing Rigging, Mines, Cranes, Derrick, Tilters, &c., by
JOHN A. ROEBLING, Civil Engineer,
TRENTON, N. J.

Doremus & Harris,

ANALYTICAL & CONSULTING CHEMISTS,
179 BROADWAY, NEW YORK.

SCHOOL OF CHEMISTRY.**To Engineers and Surveyors.**

E. BROWN AND SON Mathematical inst. makers No. 27 Fulton Slip, New York, make and keep for sale, Theodolites, Levelling inst., Levelling rods, Surveyors Compasses, and Chains, Cases of Mathematical drawing insts. various qualities, together with a general assortment of Ivory Scales and small insts. generally used by Engineers.

Ranstead, Dearborn & Co.,

MANUFACTURERS OF
LOCOMOTIVE CRANKS AND CAR AXLES,

ALSO

WROUGHT IRON SHAFTING,

And All Kinds of Hammered Shapes.

Forge at Commercial Point, Dorchester,
Office 25 Foster's Wharf, opposite No. 211 Broad St.
BOSTON.

Henry J. Ibbotson,

IMPORTER of Sheffield and Birmingham Goods.
Also, Agent for the Manufacture of Telegraph Wire.
218 PEARL ST., NEW YORK.

Cumberland, (Md.) Coals for Steaming, etc.

ORDERS RECEIVED FOR AND FILLED
by J. COWLES, 27 Wall St., N. Y.

Samuel D. Willmott,

MERCHANT, AND MANUFACTURER OF
CAST STEEL WARRANTED SAWS,
—AND FILES—

IMPORTER OF THE
GENUINE WICKESLY GRINDSTONES
NO. 8 LIBERTY STREET,
NEW YORK.

Railroad Instruments.

THEODOLITES, TRANSIT COMPASSES, and Levels, with Fraunhoffer's Munich Glasses, Surveyor's Compasses, Chains, Drawing Instruments, Barometers, etc., all of the best quality and workmanship, for sale at unusually low prices, by
E. & G. W. BLUNT,

No. 179 Water St., cor. Burling Slip.
New York, May 19, 1849.

IRON.**Railroad Iron.**

3,000 TONS C. L. MAKE 63½ lbs. per yard, now landing and to arrive.

Also contracts made for future delivery of above superior make English Iron.

300 Tons Banks Best Iron, Round, Square and Flat.
200 " English Bar " " " "

10 " 9-16 Square Iron for Railroad Spikes.

For sale in lots to suit purchasers by

DAVID W. WETMORE.

New York, March 26, 1860. 3m

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract to deliver Rails of superior quality, and of any size or pattern, to any ports of discharge in the United States.

COLLINS, VOSE & CO.,

74 South St.

New York, June 1, 1850.

Railroad Iron.

1,500 Tons weighing 58 lbs. per lineal yard.

500 " " 57 " " "

500 " " 56 " " "

500 " " 60 & 61 lbs. " "

Also 2½ flat rails. All the above being of approved patterns. For sale by

DAVIS, BROOKS, & CO.,

68 Broad street.

N.B.—Rails imported on commission, or at a fixed price.

Iron.

Pig Iron, Anthracite and Charcoal; Boiler and Flue Iron, Spring and Blistered Steel, Nail Rods, Best Refined Bar Iron, Railroad Iron, Car Axles, Nails, Stove Castings, Cast Iron Pipes of all sizes, Railway Chairs of approved patterns for sale by

COLEMAN, KELTON & CAMBELL,

109 N. Water St., Philadelphia.

IRONDALE PIG METAL, MANUFACTURED

and for sale by the Bloomsburg Railroad Iron Co.
LINDLEY FISHER, Treasurer.
75 N. Water St., Philadelphia.

Railroad Iron.

2000 Tons, weighing 58 pounds per lineal yard, of the most approved pattern of T rails, in store and to arrive, for sale by

COLLINS, VOSE & CO.,

74 South St.

New York, June 1, 1850.

Railroad Iron.

1650 Tons, weighing about 61 lbs. per yard, 40 tons, weighing about 52 lbs. per yard, and 825 tons, weighing about 53½ lbs. per yard, of the latest and most approved patterns of T rail, for sale by

BOORMAN, JOHNSTON & CO.,

119 Greenwich street.

New York, Aug. 26, 1850.

N.B.—B. J. & Co are also prepared to take contracts for English rails, delivered in any of the Atlantic ports of the United States.

Railroad Iron.

THE UNDERSIGNED, HAVING made arrangements abroad, are prepared to contract for the delivery of Foreign rails, of approved brands upon the most favorable terms.

They will also make contracts for American rails, made at their Trenton works, from Andover Iron, in whole or in part, as may be agreed upon.

They are prepared to furnish Telegraph, Spring and Market Wire; Braziers and Wire Rods; Rivets and Merchant Bars to order, all made exclusively from Andover Iron. The attention of parties who require iron of the very best quality for special purposes, is respectfully invited.

COOPER & HEWITT,

17 Burling Slip, New York.

February 15, 1850.

Glendon Refined Iron.

Round Iron, Band Iron, Hoop Iron,
Square " Flat " Scroll "

Axles, Locomotive Tyres,

Manufactured at the Glendon Mills, East Boston, for sale by

GEORGE GARDNER & CO.,

5 Liberty Square, Boston, Mass.

Sept. 15, 1849.

3m37

PATENT HAMMERED RAILROAD, SHIP & BOAT SPIKES.—The Albany Iron Works have always on hand, of their own manufacture, a large assortment of Railroad, Ship and Boat Spikes from 2 to 12 inches in length, and of any form of head. From the excellence of the material always used in their manufacture, and their very general use for railroads and other purposes in this country, the manufacturers have no hesitation in warranting them fully equal to the best spikes in market, both as to quality and appearance. All orders addressed to the subscribers at the works will be promptly executed.

JOHN F. WINSLOW, Agent.

Albany Iron and Nail Works, Troy, N. Y.

The above Spikes may be had at factory prices, of Erastus Corning & Co Albany; Merritt & Co., New York; E. Pratt & Brother, Baltimore, Md.

LAP—WELDED WROUGHT IRON TUBES

FOR

TUBULAR BOILERS,

FROM ONE AND A QUARTER TO SEVEN INCHES IN DIAMETER.

THE ONLY Tubes of the same quality and manufacture as those so extensively used in England, Scotland, France and Germany, for Locomotive, Marine and other Steam Engine Boilers.

THOMAS PROSSER & SON, Patentees,
28 Platt street, New York.

Railroad Iron.

THE UNDERSIGNED ARE PREPARED TO contract for the delivery of English Railroad Iron of favorite brands, during the Spring. They also receive orders for the importation of Pig, Bar, Sheet, etc. Iron.

THOMAS B. SANDS & CO.,

73 New street,

February 3, 1849.

New York.

Iron Store.

THE Subscribers, having the selling agency of the following named Rolling Mills, viz: Norristown, Rough and Ready, Kensington, Triadelphia, Pottsgrove and Thorndale, can supply Railroad Companies, Merchants and others, at the wholesale mill prices for bars of all sizes, sheets cut to order as large as 58 in. diameter; Railroad Iron, domestic and foreign; Locomotive tire welded to given size; Chairs and Spikes; Iron for shafting, locomotive and general machinery purposes; Cast, Shear, Blister and Spring Steel; Boiler rivets; Copper; Pig Iron, etc., etc.

MORRIS, JONES & CO.,

Iron Merchants,

Schuylkill 7th and Market Sts., Philadelphia.

August 16, 1849.

1y33

Railroad Iron.

THE MOUNT SAVAGE IRON WORKS, Alleghany county, Maryland, having recently passed into the hands of new proprietors, are now prepared, with increased facilities, to execute orders for any of the various patterns of Railroad Iron. Communications addressed to either of the subscribers will have prompt attention.

J. F. WINSLOW, President

Troy, N. Y.

ERASTUS CORNING, Albany

WARREN DELANO, Jr., N. Y.

JOHN M. FORBES, Boston.

ENOCH PRATT, Baltimore, Md.

November 6, 1848.

Railroad Iron.

THE SUBSCRIBERS ARE PREPARED TO take orders for Railroad Iron to be made at their Phoenix Iron Works, situated on the Schuylkill River, near this city, and at their Safe Harbor Iron Works, situated in Lancaster County, on the Susquehanna river; which two establishments are now turning out upwards of 1800 tons of finished rails per month.

Companies desirous of contracting will be promptly supplied with rails of any required pattern, and of the very best quality.

REEVES, BUCK & CO.

45 North Water St. Philadelphia.

March 15, 1849.

Monument Foundry.

A. & W. DENMEAD & SON,
Corner of North and Monument Sts.,—Baltimore,
HAVING THEIR

IRON FOUNDRY AND MACHINE SHOP

In complete operation, are prepared to execute faithfully and promptly, orders for
Locomotive or Stationary Steam Engines,
Woolen, Cotton, Flour, Rice, Sugar Grist, or Saw Mills,
Slide, Hand or Chuck Lathes,
Machinery for cutting all kinds of Gearing.
Hydraulic, Tobacco and other Presses,
Car and Locomotive patent Ring Wheels, warranted.

Bridge and Mill Castings of every description,
Gas and Water Pipes of all sizes, warranted,
Railroad Wheels with best faggotted axle, furnished and fitted up for use, complete.

Being provided with Heavy Lathes for Boring and Turning Screws, Cylinders, etc., we can furnish them of any pitch, length or pattern.

Old Machinery Renewed or Repaired—and Estimates for Work in any part of the United States furnished at short notice.

June 8, 1849.

Iron Wire.

REFINED IRON WIRE OF ALL KINDS.
Card, Reed, Cotton-flyer, Annealed, Broom, Buckle, and Spring Wire. Also all kinds of Round, Flat or Oval Wire, best adapted to various machine purposes, annealed and tempered, straightened and cut any length, manufactured and sold by

ICHABOD WASHBURN.

Worcester, Mass., May 25, 1849.

Wheel, Forge and Foundry Iron.

LOCUST GROVE Wheel Iron of great strength and superior chilling property.
Balt. Charcoal Forge Iron, from Patuxent, Curtis Creek and Gunpowder furnaces.

Elkridge Foundry Iron, of superior strength and softness. Anthracite and Charcoal Iron from Pennsylvania and Virginia. Gas and Water Pipes, Lamp Posts from Elkridge furnace.

LEMMON & GLENN,
619 62 Buchanan's Wharf, Baltimore.

S. S. Keyser & Co., IRON WAREHOUSE,

Corner of South and Pratt Streets,
BALTIMORE, MD.
Selling Agents for the Rough and Ready Bar Iron and Elk Boiler and Plug Iron Rolling Mills, Sarah and Taylor Furnaces, and Wrightsville Hollow Ware Foundry, and Dealers in Bar and Sheet Iron, and Cast, Sheer, German, Blister, Spring and Electroplated Steel, etc., etc.

Smith & Tyson,

GENERAL COMMISSION MERCHANTS,
No. 25 South Charles St., Baltimore, Md.

AGENTS for the Celebrated Columbia Pig Iron, suitable for Car Wheels and Chilled Rolls.
Columbia refined Charcoal Blooms; Refined Charcoal Juniata Billet Iron for Wire; Refined Iron for Bridging, of great strength; Cut Nails, Spikes, and Brads; Railroad Spikes and Wrought Chairs. 22tf

Stickney & Beatty, DEALERS IN IRON AND IRON MANUFACTURERS.

AGENTS for the Balt. City Rolling Mill, from which establishment they are prepared to furnish Ellicott's round, square, and flat bar iron, puddled and charcoal boiler plates and billet iron—also agents for the sale of the Laurel and Maryland (Balt.) charcoal forge pig irons, Balt. hard iron for chilling wheels, anti-rust nails, Catocin foundry iron, boiler blooms from the Caledonian works, Wm. Jessop & Son's cast steel, Coleman's blister steel and nail rods, hoop, band, sheet, oval and common English iron.
Nos. 18 and 20 South Charles st., Baltimore.

Railroad Iron.

CONTRACTS made by the subscribers, agents for the manufacturers, for the delivery of Railway Iron, at any part in the United States, at fixed prices, and of quality tried and approved for many years, on the oldest railways in this country.

RAYMOND & FULLERTON, 45 Cliff st.

Iron.

THE SUBSCRIBERS having resumed the agency of the New-Jersey Iron Company, are prepared to execute orders for the different kinds and sizes of iron usually made at the works of the company, and offer for sale on advantageous terms.—

150 tons No. 1 Boonton Foundry Pig Iron.
100 " No. 2 do. do. do.
300 " Nos. 2 & 3 Forge do. do.
100 " No. 2 Glendon do. do.
140 " Nos. 2 & 3 Lehigh Crane do do.
100 " No. 1 Pompton Charcoal do.
100 " New-Jersey Blooms
50 " New-Jersey Faggoting Iron, for shafts
Best Bars, $\frac{1}{2}$ to 4 inch by $\frac{1}{2}$ to 1 inch thick.
Do do Rounds and Squares, $\frac{1}{2}$ to 3 inch.
Rounds and Squares, 3-16 to 1 inch.
Half Rounds, $\frac{1}{2}$ to 1 in. Ovals & Half Ovals $\frac{1}{2}$ to 1 in.
Bands, $\frac{1}{2}$ to 4 inch. Hoops, $\frac{1}{2}$ to 2 inch.
Trunk Hoops, $\frac{1}{2}$ to 1 in. Horse Shoe & Nut Iron.
Nail Plates. Railroad Spikes.

DUDLEY B. FULLER & Co., 139 Greenwich-st. and 85 Broad-st.

WILLIAM JESSOP & SONS' CELEBRATED CAST-STEEL.

The subscribers have on hand, and are constantly receiving from their manufactory.

PARK WORKS, SHEFFIELD.

Double Refined Cast Steel—square, flat and octagon.
Best warranted Cast Steel—square, flat and octagon.
Best double and single Shear Steel—warranted.
Machinery Steel—round.

Best and 2d gy. Sheet Steel—for saws and other purposes.

German Steel—flat and square, "W. I. & S." "Eagle" and "Goat" stamps.

Genuine "Sykes," L. Blister Steel.

Best English Blister Steel, etc., etc., etc.

All of which are offered for sale on the most favorable terms by **WM. JESSOP & SONS,**

91 John street, New York.

Also by their Agents—

Curtis & Hand, 47 Commerce street, Philadelphia.
Alex' Fullerton & Co., 119 Milk street, Boston.

Stickney & Beatty, South Charles street, Baltimore.
May 6, 1848.

JOHNSON, CAMMELL & Co's Celebrated Cast Steel,

AND
ENGINEERING AND MACHINE FILES,
which for quality and adaptation to mechanical uses, have been proved superior to any in the United States. Every description of square, octagon, flat and round cast steel, sheet, shovel and railway spring steel, best double and single shear steel, German steel, flat and square, goat stamps, etc. Saw and file steel, and steel to order for any purposes, manufactured at their Cyclops Steel Works Sheffield.

JOHNSON, CAMMELL & Co.,
100 William St., New York.

November 23 1849.

Railroad Iron.

THE Undersigned, Agents for Manufacturers, are prepared to contract for the delivery of English, Welsh and Scotch Rails, of any pattern and weight, also for every description of English, Welsh, Scotch, and Swedish Iron, Railway Chairs and Spikes, Rivets, Bolts, Nuts, Washers, Chain Cables, Anchors, Tin Plates, German Spelter, Iron Castings, and every description of Machinery.

WILLIAM BIRD & CO.,
Iron and Tin Plate Merchants,
44 Wall st., New York.

And at 5 Martin's Lane, City, London,
and 140 Buchanan st., Glasgow.

July 27th, 1850.

To the Proprietors of Rolling Mills and Iron Works.

THE Undersigned—Proprietors of Townsend's Furnace and Machine Shop, Albany—are extensively engaged in the manufacture of Machinery and fixtures for Iron, and Copper Rolling Mills, and Iron Works. Having paid particular attention to the manufacture of *Rolls* (Rollers), both *chilled* and *dry-sand*, they feel confident that they can execute orders for such castings in a satisfactory manner. And to give assurance of this, they beg leave to refer to the following named persons, proprietors and managers of some of the most extensive rolling mills in the country, viz: Jno. F. Winslow, J. Tuckerman, H. Burden, W. Thurt, J. & J. Rogers, Saltus & Co., J. B. Bailey, L. C. B. Cannon, Hawkins & Atwater, etc., etc.

F. & T. TOWNSEND.

Albany, August 18, 1849.

Railroad Iron.

B. O. Railway Tires, Railway Wheels,
Scotch Pig Iron, Tin Plates and Banca Tin,
Muntz's Patent Metal Sheathing,
Baltimore Copper.

Contracts for Rails made on behalf of the manufacturers, for delivery at any ports in the United States, at fixed prices.

Bowling Tires and Tire Bars and Scotch Pigs imported to order.

Muntz's Ship-sheathing, and a general stock of Tin Plates and Banca Tin in store, and for sale by

RAYMOND & FULLERTON, 45 Cliff st.

Bowling Iron. Stamped B.O.

Railway Tire Bars Rivet Iron
Locomotive and other Axles Locomotive Frame do
Boiler Plates Bars,
and every other description of this superior Iron.

The subscribers, agents for the sale of Bowling Iron, are prepared to execute orders for importation, especially for railway and machinery uses, with despatch from the manufacturers.

RAYMOND & FULLERTON, 45 Cliff st.

Lovegrove's Patent Cast Iron Water and Gas Pipes.

THE Subscriber, the Inventor and Patentee of the Centrifugal mode of giving form to metallic substances while in a molten state, is preparing to make Cast Iron Water and Gas Pipes, of any dimensions, at prices much lower than they can be made in the old manner, and the pipes warranted to stand a pressure of three hundred pounds to the square inch, and to be soft enough to drill. Steam Engines and all kinds of machinery. Cast Iron Doors and Frames, and Mill Castings of every description, made to order.

THOMAS LOVEGROVE,

Machinist and Founder,
West Falls Avenue, below Pratt st., Baltimore.

Ray's Patent India Rubber Car Springs.

Savannah, Ga., May 22, 1850.

FOWLER M. RAY, Esq.,
Dear Sir: I have no hesitation in saying, after having used on our road your springs and Fuller's, that I consider yours decidedly the best in every particular, and in this opinion I am sustained by all our officers. Fuller's spring has a tendency to split, and also to chafe or abrade by the constant friction on the cast iron plates or disc: and in my opinion is not near so elastic as yours.

Your springs, which have been in use on our road for 12 or 15 months past, and in constant use under both passenger and freight cars, are to all appearances as elastic, sound and good, as when first put in use.

We are now building eighty-five new cars, of which for fifty-sets the springs have been ordered of you.

GEORGE A. ADAMS,

Master Carpenter,
Central Railroad and Banking Co. of Georgia.

Connecticut River Railroad Office,
Northampton, May 4, 1850.

E. CRANE, Esq.,

Dear Sir: It is now about two years since I first tried the experiment of using a set of Ray's India-rubber Springs upon one of our merchandise cars, and although the car has been in constant service since that time, I do not on examination find the slightest difference either in the thickness or elasticity of the material.

The same result has followed wherever we have applied them, either for wheel or draw springs on Engines, Tenders or Cars. At present we use no other; either in replacing old springs or building new cars—and I am perfectly satisfied that for economy, durability, safety, and ease of motion, that Ray's India-rubber is the best article for Springs which has been presented to the public.

Yours respectfully, **J. HUNT,**
Supt. Connecticut River Railroad.

EDWARD CRANE, Esq.,

Dear Sir: Having applied to cars of the Boston and Worcester Railroad Corporation, Ray's Vulcanised Rubber Springs (where they have been in use for some two years last past), I have had occasion to observe their operation, and am free to say in answer to your inquiries, that they retain their elasticity perfectly during all changes of atmospheric temperature: and are in my opinion a most valuable acquisition to Railroad Cars—are not liable to derangement, as is the case with steel springs; while at the same time it costs less to apply them. Respectfully yours,

D. N. PICKERING,

Supt. Motive Power, Bos. & Wor. Railroad,
Boston, April 15th, 1850.

FARMERS! ATTENTION!!**John Mayher & Co's**NEW AGRICULTURAL WAREHOUSE
AND SEED STORE.

197 WATER STREET, NEW YORK.

Where they have for Sale, the largest and most complete assortment of Farming Implements, ever offered for sale in this city—all of which they will sell 10 per cent. Cheaper than the same kind of Goods can be bought at any other house in the city. Our Goods are all Warranted to give satisfaction.

FARMERS wanting to purchase, will please call and examine our Stock before buying elsewhere.

Among our assortment may be found the Celebrated Highest Premium Eagle Ploughs! together with all the most approved Ploughs now in use.

Also,—Horse Powers, Threshing Machines, Fan Mills, Corn Shellers, Straw Cutters, Corn Mills, Seed Sowers, Churns, Ox Yokes, Ox Scrapers, Hay Rakes, Horse Rakes, Patent Chain Pump (that never freezes nor rusts), and other Pumps; in fact we have everything for Farming Purposes—together with Guano, Bone Dust and other Fertilizers.

JOHN MAYHER & CO.,
197 Water st., N. Y.

February 9, 1850.

N.B.—J. M. & Co. also continue their Old Stand, at 195 Front street, near Fulton Market.

**RAILROAD CAR
AND COACH TRIMMINGS.****Doremus & Nixon,**

IMPORTERS AND FURNISHERS

HAVE FOR SALE

Plain Garnet Plush. Fig. Garnet Plush (Butterfly pat.
"Crimson" "Crimson" (Elegant.
"Scarlet" " " " (Gen. Taylor.

BROCA TELLES.

Crimson Silk Brocatelles. Gold and Maroon do.
Gold and Blue " " Brown "
Silk and Wool " of every color.

MOQUETTES,

Of elegant designs and colors.

GERMAN CLOTH FOR CAR LININGS.

The most beautiful goods ever shown in this country, and the subscribers are the sole agents for the sale of them.

Oil cloths Enamelled with Gold. } These goods can be
" " Silver. } furnished in any
Do. Silver ground velvet printed. } dimensions req'd.

CURLED HAIR

Of every description and quality.

JNO. W. A. STRICKLAND, Agent.
New York, 1850. ly16**FOWLER M. RAY'S
Patent India-rubber Railroad
CAR SPRING.**New York and Erie Railroad Shops,
Piermont, March 26, 1850.

This will certify that from practical experience in the use of Fowler M. Ray's India rubber Car Springs, I believe them to be far superior to any others now in use.

I have never known them to be affected by any change of temperature, as other Rubber Springs have been affected on this road.

I am at the present time repairing a Passenger Car that Mr. Ray and myself mounted with his springs about two years and eight months since.

The springs are at the present time as perfect, to all appearances, as when first applied to the car.

Respectfully yours,

HORACE B. GARDNER,
Foreman of the Car Shops.Supt. Office N.Y. & H. R.R., }
New York, March 8, 1850. }

This is to certify that we have used the Rubber Springs manufactured by Mr. F. M. Ray for the past twenty months, "both for Passenger and Freight Car Springs and Bumpers, and of different sizes," and have in every case given entire satisfaction, and I consider them the best spring now in use.

M. SLOAT, Supt.

Boston, March 5, 1850.

In answer to your enquiry about India-rubber Springs, I have to say that we have used them to a considerable extent on both freight and passenger cars, and also on several of our tenders; and I am very well satisfied that they answer all the purposes for which they are intended. I believe the India-rubber will soon supersede all other springs for cars and tenders.

Yours truly, S. M. FELTON,
Supt. Fitchburg Railroad.Office New Jersey Railroad Co., }
Jersey City, March 8, 1850. }

FOWLER M. RAY, Esq.,
Dear Sir: In answer to your enquiries respecting the operation of the Vulcanised Rubber Springs, purchased by our company from you some two years since, I reply that they are superior to any spring in use, (that I have either seen or heard of).

The improved form of your spring, consisting of a solid piece of vulcanised rubber with bands on the outside, is far superior to your first form, consisting of disks of rubber with metallic plates interposed.

The last named form was tried, if you recollect, at a much earlier period; and then was replaced by your last form.

I have no hesitation in saying that your springs have given entire satisfaction, and most cheerfully recommend them to railroad companies throughout the country for the following reasons:

- 1st. The cost is 30 per cent. less.
- 2d. Saving of weight on each car of 8 wheels from 700 to 800 lbs.
- 3d. Less care and attention is required, as they are not liable to get out of repair.
- 4th. A great saving is secured in the wear and tear of the cars and rails from their great elasticity.
- 5th. The freedom from noise.
- 6th. There is greater safety in case of accident, as they cannot be broken.
- 7th. The comfort of passengers is enhanced sufficiently to pay the expense, waiving all the other reasons that I have given.

Should this fail to satisfy any person enquiring, you are at liberty to refer to me, No. 150 Washington St., Jersey City. Yours respectfully,

T. L. SMITH, Supt.

New York, March 11, 1850.

I have used the Patent India-rubber Spring purchased of Mr. Ray, upon the cars of the New York and New Haven Railroad, and have found them efficient and economical; and when applied to the axles and draw springs, believe them to be quite equal to any in use. I have found a combination of these springs with a steel spring under the transom beam a very satisfactory arrangement, and am now using this plan in all new cars.

Yours respectfully,

ROBERT SCHUYLER.

February 25, 1850.

From practical observation of the use of the India-rubber Car Springs, manufactured and sold by your company, we are entirely satisfied in their application, and do not hesitate to recommend them as elastic, durable, requiring no repairs for years, and retaining their consistency during all extremes of weather. We have applied them for the past two years, and consider them superior for all railroad purposes.

Yours truly,

OSGOOD BRADLEY, Car Builder, Worcester.
T. & C. WASON, do. Springfield.
DEAN, PACKARD & MILLS, do. do.
DAVENPORT & BRIDGES, do. Cambridgeport.Office of the New Jersey Railroad Co., }
Jersey City, March 7, 1850. }

This is to certify that we have had Mr. F. M. Ray's India-rubber Springs in constant use under our cars, and as Bumper Springs for upwards of two years, and they have in every way given perfect satisfaction.

The present form of spring we deem far superior to the form of Disk, having used both forms, although we have none of those made in Disks at present in use.

We take pleasure in recommending these springs to all railroad companies.

J. P. JACKSON, Vice Prest.
New Jersey Railroad and Trans. Co.

Roxbury, February 28, 1850.

In compliance with your request, I take great pleasure in stating the result of my experience in the use of "Ray's Patented Vulcanised India-rubber Car and Engine Springs." We have used them nearly two years, and never had one fail in any way. The cold weather does not affect them, as it has other rubber springs we have used.

With sixteen years' experience as superintendent of machinery on the Boston and Providence railroad, I take pleasure in saying that your springs are the best we ever used, or I ever saw used elsewhere. We have 20 cars rigged with them, of which I can say that the springs are as good now as when first applied. I put 24 lbs. of the rubber under the forward end of one of our heaviest engines, taking off 250 lbs. of steel springs—it has been in use 18 months, and is in as good condition now as when first put under the engine.

Very respectfully yours,

GEO. S. GRIGGS,
Supt. of Machinery, Boston and Prov. R.R.

Fall River, February 2, 1850.

In answer to yours of the 20th ult. I would say that this company has for some 10 or 12 months past been using "Ray's India-rubber Springs." We have applied them to both passenger and freight cars with uniform success. They have invariably preserved their elasticity and consistency through all the extremes of weather; and we are now applying them whenever the steel spring fails. I am well satisfied that they are particularly adapted for railroad purposes.

Very respectfully yours,

GEO. HAVEN,
Supt. Fall River Railroad.

Jersey City, March 9, 1850.

This is to certify that the present form of Mr. F. M. Ray's India-rubber Car Spring I consider far superior to the form of Disk, having used both forms.

I take pleasure in recommending these springs to all railroad companies. DAVID H. BAKER,
Foreman of Car Shop of N.J. R.R. & Trans. Co.

Harlem R.R. Depot, }
New York, March 7, 1850. }

This is to certify that we have used Mr. F. M. Ray's India-rubber Springs for over eighteen months, and find them to be easy and durable, and recommend them to railroad companies as being superior to anything we have tried.

J. M. SMART,

Foreman at 42d St. Depot.

Old Colony Railroad Office,
Boston, March 6, 1850.

EDWARD CRANE, Esq.,

President New England Car Co.,

Dear Sir: In compliance with your request I would state that the Old Colony Railroad Company have had in use upon their road, India-rubber Springs furnished by your company, for more than eighteen months past, during which time they have been extensively used under Passenger and Freight Cars, Locomotive Tenders, and for Drawer and Bumping Springs, with the most perfect success. The elasticity and consistency of the Rubber has never been unfavorably affected by either extremes of heat or cold—and from the experience which we have had in the use of Rubber Springs, I think them well adapted for railroad purposes—and therefore we have for some months past used Rubber almost exclusively, in all places where springs are required.

Respectfully yours, etc.,

JAS. H. MOORE,
Supt. O. C. Road.

Troy, February 27, 1850.

We have been using your India-rubber Car Springs for nearly two years—and we take pleasure in saying that in our opinion the rubber has to a certain extent already, and may eventually entirely supersede all other Springs for Railroad Car purposes. We now use it entirely for Draw Springs and Bumpers, considering it better and lighter than steel.

During our two years' experience in the use of it, we have not known any to lose their elasticity, or fail in any way; and we cheerfully recommend the rubber for railroad car springs. Very respectfully,

EATON, GILBERT & CO.

Passenger Car Linings.

THE Advertiser continues to make to order the Enamelled Car Linings which have been so highly approved the last three years, and are now exclusively used by all the Northern Railroads. No pains are spared to get out new styles, and adapt them to the tastes of every consumer.

Orders addressed to CHARLES STODDER, No. 75 Kilby street, Boston, will have prompt attention. March 23, 1850.

India-rubber for Railroad Cos.

RUBBER SPRINGS—Bearing and Buffer—Fowler's Patent—Hose from 1 to 12 inches diameter. Suction Hose. Steam Packing—from 1-16 to 2 in. thick. Rubber and Gutta Percha Bands. These articles are all warranted to give satisfaction, made under Tyer & Helm's patent, issued January, 1849.—No lead used in the composition. Will stand much higher heat than that called "Goodyear's," and is in all respects better than any in use. Proprietors of railroads do not be overcharged by pretenders.

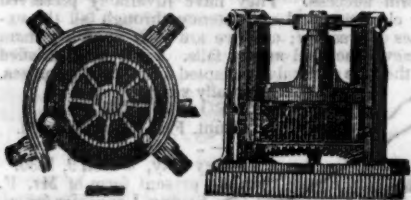
HORACE H. DAY,

Warehouse 23 Courtlandt street,
New York, May 21, 1849.**Spikes, Spikes, Spikes.**

ANY person wishing a simple and effective Spike Machine, or a number of them, may be supplied by addressing J. W. FLACK,
Troy, N. Y.
March 6, 1850.

MACHINERY.

Henry Burden's Patent Revolving Shingling Machine.



THE Subscriber having recently purchased the right of this machine for the United States, now offers to make transfers of the right to run said machine, or sell to those who may be desirous to purchase the right for one or more of the States.

This machine is now in successful operation in ten or twelve iron works in and about the vicinity of Pittsburgh, also at Phoenixville and Reading, Pa., Covington Iron Works, Md., Troy Rolling Mills, and Troy Iron and Nail Factory, Troy, N. Y., where it has given universal satisfaction.

Its advantages over the ordinary Forge Hammer are numerous: considerable saving in first cost; saving in power; the entire saving of shingler's, or hammerman's wages, as no attendance whatever is necessary, it being entirely self-acting; saving in time from the quantity of work done, as one machine is capable of working the iron from sixty puddling furnaces; saving of waste, as nothing but the scoria is thrown off, and that most effectually; saving of staffs, as none are used or required. The time required to furnish a bloom being only about six seconds, the scoria has no time to set, consequently is got rid of much easier than when allowed to congeal as under the hammer. The iron being discharged from the machine so hot, rolls better and is much easier on the rollers and machinery. The bars roll sounder, and are much better finished. The subscriber feels confident that persons who will examine for themselves the machinery in operation, will find it possesses more advantages than have been enumerated. For further particulars address the subscriber at Troy, N. Y.

P. A. BURDEN.

Railroad Spikes and Wrought Iron Fastenings.

THE TROY IRON AND NAIL FACTORY, exclusive owner of all Henry Burden's Patented Machinery for making Spikes, have facilities for manufacturing large quantities upon short notice, and of a quality unsurpassed.

Wrought Iron Chairs, Clamps, Keys and Bolts for Railroad fastenings, also made to order. A full assortment of Ship and Boat Spikes always on hand.

All orders addressed to the Agent at the Factory will receive immediate attention.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

CHILLED RAILROAD WHEELS.—THE UNDERSIGNED are now prepared to manufacture their Improved Corrugated Car Wheels, or Wheels with any form of spokes or discs, by a new process which prevents all strain on the metal, such as is produced in all other chilled wheels, by the manner of casting and cooling. By this new method of manufacture, the hubs of all kinds of wheels may be made whole—that is, without dividing them into sections—thus rendering the expense of banding unnecessary; and the wheels subjected to this process will be much stronger than those of the same size and weight, when made in the ordinary way.

A. WHITNEY & SON,
Willow St., below 13th,
Philadelphia, Pa.

Brown's Old Established SCALE WARE HOUSE,

NO. 234 WATER ST., NEW YORK.

THE Subscriber, Practical Manufacturer of Scales of every description, respectfully asks the attention of Railroad Companies to his Improved Wrought Iron Railroad Track and Depot Scales which for strength, durability, accuracy, convenience in weighing, and beauty of workmanship, are not surpassed by any others in this country.

He is aware that this is rather a bold assertion for him to make, yet he can say with confidence that they have but to be tried to give them precedence over all others.

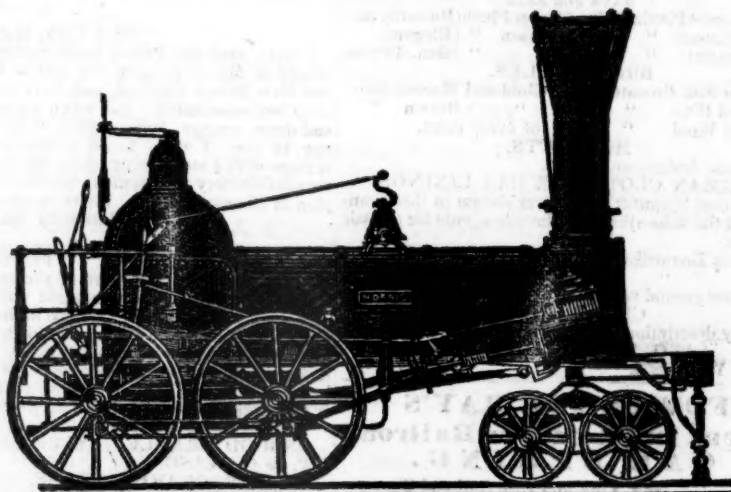
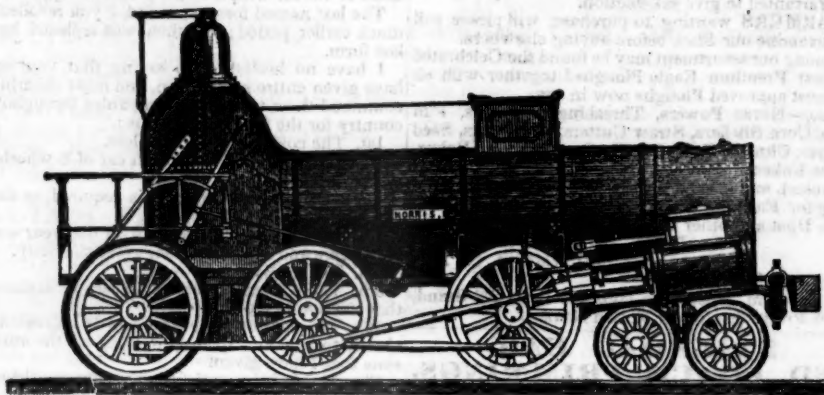
J. L. BROWN.

Bank Scales made to order, and all Scales of his make Warranted in every particular.

References given if required

NORRIS' LOCOMOTIVE WORKS.

BUSHHILL, SCHUYLKILL SIXTH-ST., PHILADELPHIA.



THE UNDERSIGNED Manufacture to order Locomotive Steam Engines of any plan or size. Their shops being enlarged, and their arrangements considerably extended to facilitate the speedy execution of work in this branch, they can offer to Railway Companies unusual advantages for prompt delivery of Machinery of superior workmanship and finish.

Connected with the Locomotive business, they are also prepared to furnish, at short notice, Chilled Wheels for Cars of superior quality.

Wrought Iron Tyres made of any required size—the exact diameter of the Wheel Centre, being given, the Tyres are made to fit on same without the necessity of turning out inside.

Iron and Brass castings, Axles, etc., fitted up complete with Trucks or otherwise.

NORRIS, BROTHERS

PATENT MACHINE MADE HORSE-SHOES.

The Troy Iron and Nail Factory have always on hand a general assortment of Horse Shoes, made from Refined American Iron.

Four sizes being made, it will be well for those ordering to remember that the size of the shoe increases as the numbers—No. 1 being the smallest.

P. A. BURDEN, Agent,
Troy Iron and Nail Factory, Troy, N. Y.

Etna Safety Fuse.

THIS superior article for igniting the charge in wet or dry blasting, made with DUPONT'S best powder, is kept for sale at the office and depot of

REYNOLDS & BROTHER,

Sole Manufacturers,

No. 85 Liberty St.

NEW YORK.

And in the principal cities and towns in the U. States. The Premium of the AMERICAN INSTITUTE was awarded to the Etna Safety Fuse at the late Fair held in this city.

November 3, 1849.

COLUMBUS, OHIO,

Railroad Car Manufactory. RIDGWAYS & KIMBALL,

HAVE established at this central point, the manufacture of Passenger, Freight, Gravel and Hand Cars for Railroads, and assure all Western Railroad Companies that it will be their constant aim to procure the best materials and workmen, and to turn out the best kind of work at fair prices. Specimens may be seen on the Columbus and Xenia Railroad. The patronage of Railroad Companies is respectfully solicited.

178

To Inventors and Patentees.

OWEN G. WARREN, ARCHITECT, Has had many years' experience as Agent for obtaining Patents, both in this country and Europe, and will transact such business promptly and reasonably. Persons at a distance can have their business done by correspondence—without the necessity of visiting this city or Washington. Office No. 94 Merchants Exchange Wall st., corner of Hanover st., up stairs.

179

Mr. Hale:—"The New England Car Co., having been engaged for the last six months in introducing the Vulcanized India-rubber Car Springs upon the different railroads in this and other states, and having in particular introduced it upon the Boston and Worcester railroad with perfect success, were much gratified to find, by your paper of this morning, that the article had given satisfaction to the president of that corporation, and the terms of just commendation in which you were pleased to speak of it. But their gratification was scarcely equalled by their surprise, when, or arriving at the close of your paragraph, they found the results of all their labors attributed to a foreign source, with which the New England Car Co. has no connection. The material used on the Boston and Worcester railroad, and all the other railroads in this country, where any preparation of India-rubber has been successfully applied, is entirely an American invention, patented in the year 1844 to Charles Good-year, of New Haven, Conn., and the application of it to this purpose and the form in which it is applied are the invention of F. M. Ray of New York. The only material now in use, and so far as has yet appeared, the only preparation of India rubber capable of answering the purpose, has been furnished under these patents by the New England Car Company, manufactured under the immediate inspection of their own agent. If any other should be produced, the right to use it would depend upon the question of its interference with Mr. Goodyear's patent. The New England Car Company have their place of business in this city at No. 99 State street, and are prepared to answer all orders for the Vulcanized India rubber Car Springs, of the same quality and of the same manufacture as those which they have already placed on your road, and most of the other roads terminating in this city."

And yet Mr. Kneivt is using these experiments made upon the Springs of the Car Company to induce the public to purchase his springs, and is attempting to impose upon them the belief that the springs used were furnished by him! We ask whether such a course is honorable, or entitles his statements to much consideration from the public.

The above Springs are for sale 98 Broadway, New York, and 99 State street, Boston.

EDWARD CRANE Agent, Boston.
F. M. RAY, Agent, New York.

Boston, May 8, 1849.

STABILITY—SECURITY—PERPETUITY. Mutual Life Insurance Co. of New York.

No. 35 WALL STREET.
A MILLION OF DOLLARS

Securely invested in Bonds and Mortgages on real estate in this city and Brooklyn, and stocks of the State and City of New York, and United States Government.

The company declared a dividend of profits of fifty-two per cent. on all existing policies on the 31st of January, 1848.

All the Profits are Divided Among the Insured. Persons may effect insurance on their own lives and the lives of others.

A married woman can insure the life of her husband, the benefits of which are secured by law for the exclusive use of herself or children.

Clergymen and all others dependent upon salaries or their daily earnings are specially invited to avail themselves of a resource whereby their surviving families may be secured from the evils of penury.

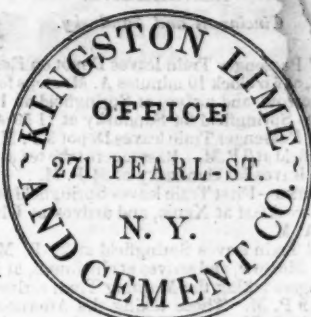
Pamphlets explanatory of the principles of Mutual Life Insurance, and illustrating its advantages, with forms of application, may be obtained at the office of the company, 35 Wall street, or of any of its agents.

TRUSTEES.

Jos. B. Collins,	Abraham Bininger,
Wm. J. Hyslop,	Alfred Edwards,
R. H. McCurdy,	Wm. Betts,
Fred. S. Winston,	Joseph Blunt,
C. W. Faber,	Isaac G. Pearson,
John P. Yelverton,	Henry Wells,
Theo. Sedgwick,	Wm. Moore,
Stacy B. Collins,	George R. Clark,
John H. Swift,	Jona. Miller,
John Wadsworth,	David A. Comstock,
S. M. Cornell,	Robert Schuyler,
Gouv. M. Wilkins,	James Chambers,
John V. L. Pruyn,	Joseph Tuckerman,
Jas. S. Wadsworth,	Moses H. Grinnell,
Charles Ely,	Wm. J. Banker,
John C. Cruger,	John M. Stuart,
Charles King,	Francis S. Lathrop,
Alfred Pell,	Nathaniel Hayden.

JOSEPH B. COLLINS, President.
ISAAC ABBATT, Secretary.

Hydraulic Cement.



HYDRAULIC CEMENT, OF BEST QUALITY, manufactured at their works, for sale in lots to suit purchasers.

Also, Ground Lime, a superior article for Builders.
ISAAC FRYER, Sec'y.

January 19, 1850.

Engine and Car Works, PORTLAND, MAINE.

THE PORTLAND COMPANY, Incorporated August 8th, 1846, with a capital of \$250,000, have erected their extensive Works upon the deep water of Portland Harbor, and receive and transport, to and from their works direct, to and from vessels of any class.

They now manufacture to order, and deliver upon the Railroads running in each direction from the city, or on shipboard as wanted, Locomotive, Stationary, or Steam Boat Engines; Passenger, Mail, Freight, Earth and Hand Cars; Railway Frogs, Switches, Chairs and Castings; and every other description of Machinery.

HORACE FELTON,
Superintendent.

JAMES C. CHURCHILL,
General Agent and Clerk.

RAILROADS.

EASTERN RAILROAD.

SUMMER ARRANGEMENT.

On and after Monday, June 17th, 1850, trains will leave Boston daily (Sundays excepted);

For Lynn, 7 9 $\frac{1}{2}$, 11 a.m., 12 m., 2 $\frac{1}{2}$, 4 $\frac{1}{2}$, 5, 6, 7 p.m.
Salem, 7 9 $\frac{1}{2}$, 11 a.m., 12 m., 2 $\frac{1}{2}$, 3, 4 $\frac{1}{2}$, 6, 7 p.m.
Manchester and Gloucester, 9 $\frac{1}{2}$ a.m., 3, 6 p.m.
Marblehead, 7 9 $\frac{1}{2}$, 12 a.m., 2 $\frac{1}{2}$, 4 $\frac{1}{2}$, 6, 7 p.m.
Ipswich, 7 11, 12 a.m., 2 $\frac{1}{2}$, 4 $\frac{1}{2}$, 7 p.m.
Newburyport, 7 11, 12 a.m., 2 $\frac{1}{2}$, 4 $\frac{1}{2}$, 7 p.m.
Portsmouth, 7 11 a.m., 4 $\frac{1}{2}$ p.m.
Portland, Me., 7 11 a.m., 4 $\frac{1}{2}$ p.m.

And for Boston,

From Portland, 5, 10 $\frac{1}{2}$ a.m., 5 p.m.
Portsmouth, 7 $\frac{1}{2}$, 9 a.m., 1, 7 $\frac{1}{2}$ p.m.
Newburyport, 6 $\frac{1}{2}$, 8 $\frac{1}{2}$, 11 a.m., 1 $\frac{1}{2}$, 5, 8 p.m.
Ipswich, 7 40, 8 35, 11 42 a.m., 2 20, 5 22, 8 $\frac{1}{2}$ p.m.
Gloucester, 7 $\frac{1}{2}$ a.m., 1 $\frac{1}{2}$, 8 p.m.
Manchester, 7 a.m., 2 p.m.
Salem, 6 $\frac{1}{2}$, 7 $\frac{1}{2}$, 8 $\frac{1}{2}$, 9 $\frac{1}{2}$, 10 $\frac{1}{2}$ a.m., 12 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 6 $\frac{1}{2}$, 9 $\frac{1}{2}$ p.m.
Lynn, 6 $\frac{1}{2}$, 7 $\frac{1}{2}$, 8 $\frac{1}{2}$, 9 $\frac{1}{2}$, 10 $\frac{1}{2}$ a.m., 12 $\frac{1}{2}$, 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 6 $\frac{1}{2}$, 9 $\frac{1}{2}$ p.m.

* Or on their arrival from the East.

Freight trains each way daily. Office 17 Merchants' Row, Boston.

JOHN KINSMAN, Superintendent.

ALBANY AND BUFFALO RAILROADS.

Four Trains daily, Sundays excepted, viz:
Leave Albany, 6 a.m., 9 a.m., 2 p.m., 7 p.m.
Reach Buffalo, 15 hours, 18 hours, 23 hours, 18 hours.
Arrive from Buffalo, 7 p.m., 2 $\frac{1}{2}$ a.m., 12 $\frac{1}{2}$ m., 3 $\frac{1}{2}$ p.m.

Passengers by the Express Train reach Buffalo from New York, and New York from Buffalo, in 24 hours. The Isaac Newton and Oregon connect at Albany with this Train. Baggage cars, with careful baggage masters, run through with all the trains.

For Schenectady, Saratoga Springs & Whitehall, Leave Albany at 7 a.m. and 2 p.m. For Schenectady only at 6, 7 and 9 a.m. and 12 $\frac{1}{2}$, 2 and 7 p.m. For Erie Canal packets at 7 a.m. and 7 p.m. By Plank Road from Schenectady to Saratoga at all hours by stages, etc.

The Eastern Trains leave Albany at 7 a.m. and 3 p.m. The wagons of the company take baggage free between railroads and steamboats at Albany.

E. FOSTER, Jr., Sec'y
Albany and Schenectady Railroad Co.

Albany, August, 1849.

BOSTON AND MAINE RAILROAD.

Summer Arrangement, 1850.

Outward Trains from Boston

For Portland at 7, 11, a.m. and 4 $\frac{1}{2}$ p.m.
For Great Falls at 7, 11, a.m., 4 $\frac{1}{2}$ p.m.
For Haverhill at 7, 9, 11 a.m., 2 $\frac{1}{2}$, 4 $\frac{1}{2}$, 6 $\frac{1}{2}$ p.m.
For Lawrence (South Side,) 7, 11 a.m., 2 $\frac{1}{2}$, 4 $\frac{1}{2}$, 6 $\frac{1}{2}$ p.m.
" (North ") 7 $\frac{1}{2}$, 9, a.m. 12 m., 5, 6 $\frac{1}{2}$ p.m.

For Reading 7, 9, 11 a.m. 12 m. 2 $\frac{1}{2}$, 4 $\frac{1}{2}$, 5, 6 $\frac{1}{2}$, 7 $\frac{1}{2}$, 9 $\frac{1}{2}$ p.m.
The Station in Boston is on Haymarket Square.

THOS. S. WILLIAMS, Super't.

July 1, 1850.

NEW YORK AND HARLEM RAILROAD. NEW ARRANGEMENT.

On and after Wednesday, October 17th, 1849, the Cars will run as follows, (Sundays excepted) until further notice:

Trains will leave the City Hall, New York, for—

Harlem and Morrisania at 6 $\frac{1}{2}$, 8, 10, 11, 12 a.m., 2, 3 $\frac{1}{2}$, 4, 5, 6 $\frac{1}{2}$ p.m.

New Village, at 8 $\frac{1}{2}$, 10, 12 a.m., 3 $\frac{1}{2}$, 5, 6 $\frac{1}{2}$ p.m.

Fordham and Williams' Bridge, at 8 $\frac{1}{2}$, 10, 12 a.m., 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5, 6 $\frac{1}{2}$ p.m.

Hunt's Bridge, Underhill's and Hart's Corners, at 8 $\frac{1}{2}$, 10 a.m., 3 $\frac{1}{2}$, 5 p.m.

Tuckahoe and White Plains, at 8 $\frac{1}{2}$, 10 a.m., 2 $\frac{1}{2}$, 3 $\frac{1}{2}$, 5 p.m.

Pleasantville, New Castle, Bedford, Mechanicsville, Purdy's, Croton Falls, and Intermediate stations, on signal, 8 $\frac{1}{2}$ a.m., 2 $\frac{1}{2}$, 3 $\frac{1}{2}$ p.m.

Brewster's, Towner's, Patterson, Paulding's, South Dover, Dover Furnace, and Dover Plains, 8 $\frac{1}{2}$ a.m., 2 $\frac{1}{2}$ p.m.

NOTICE—Passengers are reminded of the great danger of standing upon the platform of the cars, and hereby notified that the practice is contrary to the rules of the Company, and that they do not admit any responsibility for injury sustained by any passenger upon the platforms, in case of accident.

Returning to New York will leave

Harlem and Morrisania at 6 08, 7 $\frac{1}{2}$, 8 37, 9, 10 6, 12 a.m., 1 43, 3 07, 3 $\frac{1}{2}$, 5, 5 47 p.m.

New Village, at 5 58, 8 27, 9 56 a.m., 1 33, 2 57, 5 36 p.m.

Fordham and William's Bridge at 5 $\frac{1}{2}$, 8 14, 9 43, 10 57 a.m., 1 20, 2 44, 5 24 p.m.

Hunt's Bridge at 8 04, 9 33 a.m., 2 34, 5 16 p.m. On signal.

Underhill's, at 7 56, 9 23 a.m., 2 26, 5 10 p.m. On signal.

Tuckahoe at 7 53, 9 18, 10 40 a.m., 2 23, 5 08 p.m.

Hart's Corners at 7 38, 9 03 a.m., 2 08, 4 54 p.m.—On signal.

White Plains at 7 $\frac{1}{2}$, 8 55, 10 20 a.m., 2, 4 47 p.m.

Davis' Brook at 8 40, 10 11 a.m., On signal. 4 39 p.m. On signal.

Unionville, 8 27, 10 11 a.m. On signal. 4 29 p.m.—On signal.

Pleasantville at 8 20, 9 56 a.m., 4 24 p.m.

Chappaqua, at 8 10, 9 50 a.m. On signal. 4 18 p.m. On signal.

New Castle, at 7 56, 9 38 a.m., 4 07 p.m.

Bedford at 7 46, 9 32 a.m., 4 02 p.m.

Mechanicsville at 7 36, 9 22 a.m., 3 52 p.m.

Golden's Bridge, 7 28, 9 17 a.m. On signal, 3 47 p.m. On signal.

Purdy's at 7 20, 9 09 a.m., 3 39 p.m.

Croton Falls, at 7 $\frac{1}{2}$, 9 04 a.m., 3 34 p.m.

Brewster's, at 8 50 a.m., 3 20 p.m.

Towner's, at 8 35 a.m., 3 05 p.m.

Patterson, at 8 27 a.m., 2 57 p.m.

Paulding's, at 8 17 a.m., 2 47 p.m.

South Dover, 8 02 a.m., 2 32 p.m.

Dover Furnace, 7 55 a.m., 2 25 p.m.

Dover Plains, at 7 45 a.m., 2 15 p.m.

The trains for Harlem and Morrisania leaving City Hall at 6 $\frac{1}{2}$, 8, 10, 11, 12, 2, 4 and 6 $\frac{1}{2}$, returning from Morrisania and Harlem at 6 08, 7 $\frac{1}{2}$, 9, 12, 1 43, 3 07, 3 $\frac{1}{2}$ and 5 o'clock, will land and receive passengers at 27th 42d, 51st, 61st, 79th, 86th, 109th, 115th, 125th and 132d streets.

The Dover Plains train from New York at 2 $\frac{1}{2}$ p.m., returning leaving Dover Plains at 7 $\frac{1}{2}$ a.m., will not stop between White Plains and New York, (except at Tuckahoe, Williams' Bridge and Fordham), unless to leave passengers coming from above Croton Falls.

A car will precede each train ten minutes to take up passengers in the city. The last car will not stop, except at Broome st. and 27th street.

Freight Trains leave New York at 1 o'clock p.m.—Returning, leaves Dover Plains at 12 o'clock m.

For Sunday Arrangements, see hand bills.

M. SLOAT, Sup't.

FAIRBANKS' RAILROAD SCALES.—THE subscribers are prepared to construct at short notice, *Railroad and Depot Scales*, of any desired length and capacity. Their long experience as manufacturers—their improvements in the construction of the various modifications, having reference to strength, durability, retention of adjustment, accuracy of weight and dispatch in weighing—and the long and severe tests to which their scales have been subjected—combine to ensure for these scales the universal confidence of the public.

No other scales are so extensively used upon railroads, either in the United States or Great Britain, and the managers refer with confidence to the following in the United States.

Eastern Railroad.	Boston & Maine Railroad.
Providence Railroad.	Providence and Wor. Road.
Western Railroad.	Concord Railroad.
Old Colony Railroad.	Fitchburg Railroad.
Schenectady Railroad.	Syracuse and Utica Road.
Balt. and Ohio Railroad.	Baltimore and Susq. Road.
Phila. & Reading Road.	Schuylkill Valley Road.
Central (Ga.) Railroad.	Macon and Western Road.
	New York and Erie Railroad.

And other principal Railroads in the Western, Middle and Southern States.

E. & T. FAIRBANKS & CO.

St. Johnsbury, Vt.

Agents, } FAIRBANKS & Co., 89 Water St., N. York.
 { A. B. NORRIS, 196 Market St. Philadelphia.
 April 22, 1849. 1y*17

NOTICE TO

Superintendents of Railroads.

TYLER'S PATENT SAFETY SWITCH.—The undersigned would respectfully call their attention to his Patent Safety Switch, which from long trial and late severe tests has proved itself perfectly reliable for the purpose for which it was intended. It is designed to prevent the train from running off when the switch is set to the wrong track by design or accident. The single rail or gate switch is established as the best and safest switch for the ordinary purpose of shifting cars from one track to another, but it is liable to the serious evil of having one track open or broken when connected with the other. My improvement entirely removes this evil, and while it accomplishes this important office, leaves the switch in its original simplicity and perfection of a plain unbroken rail, connecting one track with the other ready for use.

The following decision of the Commissioner of Patents is respectfully submitted to Railroad Engineers, Superintendents, and all others interested in the subject.

P. B. TYLER.

(COPY.)

UNITED STATES PATENT OFFICE,
 Washington City, D.C., April 28th, 1846.

SIR: You are hereby informed that in the case of the interference between your claims and those of Gustavus A. Nicolls, for improvements in safety switches—upon which a hearing was appointed to take place on the 3d Monday in March, 1846, the question of priority of invention has been decided in your favor. Inclosed is a copy of the decision. The testimony in the case is now open to the inspection of those concerned.

Yours respectfully,
 EDMUND BURKE,
 Commissioner of Patents.

To Philip B. Tyler.

Any further information may be obtained by addressing P. B. TYLER, Springfield, Mass., or JOHN PENDLETON, Agent, 149 Hudson St., New York.

**NORRIS' LOCOMOTIVE WORKS,
 SCHENECTADY, N. Y.**

THESE Works are in full operation in Manufacturing to order, Locomotive Steam Engines & Tenders, of the best principle and construction of material, using wrought iron heavy frames with pedestals welded thereto, and all parts of the engine made of the best wrought iron, except cylinders, pumps and boxes—obtaining greater durability, and carrying less weight over the road, than engines constructed of cast iron.

Wrought Iron Tires made any required size, and Tire Bars bent and welded with dispatch.

Chilled Wheels for Cars, Trucks and Tenders, made from the toughest iron.

Driving and Tender and Car Wheels fitted to Axles with Brass Boxes and Springs, and Railroad Machinery generally. Manufactured and for sale by

April 11, 1849.

E. S. NORRIS.

CORROSIVE SUBLIMATE.

THIS article now extensively used for the preservation of timber, is manufactured and for sale by **POWERS & WEIGHTMAN**, manufacturing Chemists, Philadelphia.
 Jan. 20, 1849.

CENTRAL RAILROAD FROM SAVANNAH

TO MACON, (Ga.) 100 miles.

Passenger Trains leave Savannah and Macon daily at 4 a.m.

Passenger trains arrive daily at Savannah, 6 15 p.m.
 " " " " Macon, 6 45 p.m.

This road, in connection with the Macon and Western road from Macon to Atlanta, and the Western and Atlantic road from Atlanta to Dalton, now forms a continuous line of 391 miles in length* from Savannah to Dalton, Murray county, Ga. and with the Memphis Branch railroad, and Stages connect with the following places:

Tickets from Savannah to Macon,	\$5 75
" " " Atlanta,	9 50
" " " Augusta,	6 50
" " " Columbus,	15 00
" " " Opelika,†	17 00
" " " Jacksonville, Ala.,	20 00
" " " Talladega,	
" " " Huntsville } Ala.,	22 00
" " " Decatur,	
" " " Tusculuma, Ala.,	22 50
" " " Tuscaloosa, Ala.,	
" " " Columbus, Miss,	28 00
" " " Aberdeen, "	
" " " Holly Springs,	
" " " Nashville, Tenn.,	
" " " Murphreesboro',	25 00
" " " Columbia, do.,	
" " " Memphis, do.,	30 00

An extra Passenger Train leaves Savannah on Saturdays, after the arrival of the Steam-ships from New York, for Macon, and connects with the Macon and Western railroad; and on Tuesdays, after the arrival of the Macon and Western cars, an extra Passenger Train leaves Macon to connect with the Steam ships for New York.

Stages for Tallahassee and intermediate places connect with the road at Macon, Mondays, Wednesdays, and Fridays, and with Milledgeville at Gordon daily.

Passengers for Montgomery, Mobile and New Orleans take stage for Opelika from Barnesville through Columbus, a distance of 97 miles, or from Griffin through West Point, a distance of 93 miles.

* The Western and Atlantic railroad will soon be completed between Dalton and Chattanooga, a distance of 423 miles from Savannah, of which due notice will be given.

† Head of the West Point and Montgomery railroad, on which the fare to Montgomery is about \$2.

**RATES OF FREIGHT FOR MERCHANDISE GENERALLY,
 FROM SAVANNAH TO MACON.**

Measurement Goods.—Boxes of hats, bonnets, furniture, shoes, saddlery, dry-goods, and other measurement goods, per cubic foot 13 cents.
 Crockery Ware, in crates, boxes or hhds, per cubic foot 10 "
 Goods by Weight, 1st class.—Boxes of glass, paints, drugs & confectionary, per 100 lbs., 50 "
 2d class.—Sugar, coffee, rope, butter, cheese, lard, tobacco, leather, hides, copper, sheet and hoop iron, tin, hard and hollow ware, rice, boxes soap and candles, bagging, and other heavy articles not enumerated below, per 100 lbs., 45 "
 3d class.—Flour, bacon, liquors, pork, beef, fish, tallow and beeswax, per 100 lbs., 40 "
 4th class.—Mill-gearing, pig and bar iron, grind and millstones, nails, spikes and coal, 100 lb. 30 "
 Barrels of beets, bread, crackers, potatoes, ice, fruit, oysters, onions, and all light bbls, each, 75 "
 Oil and molasses per hhd., (smaller casks in proportion) 56 00 "
 Salt per sack not exceeding 4 bushels, 50 "
 Goods consigned to Thos. S. Wayne, Forwarding Agent, Savannah, will be forwarded free of commission.
 WM. M. WADLEY, Supt.
 Savannah, Ga., February 24, 1850.

**ENGINEERS' AND SURVEYERS'
 INSTRUMENTS MADE BY
 EDMUND DRAPER,
 Surviving partner of
 STANCLIFFE & DRAPER.**



No 23 Pear street,
 near Third,

below Walnut,
 Philadelphia.

**GEORGIA RAILROAD. FROM AUGUSTA
 TO ATLANTA—171 MILES.**

AND WESTERN AND ATLANTIC RAILROAD, FROM ATLANTA TO DALTON, 100 MILES.

This Road, in connection with the South Carolina Railroad, and Western and Atlantic Railroad, now forms a continuous line, 408 miles in length, from Charleston to Dalton (Cross Plains) in Murray county, Ga. 32 miles from Chattanooga, Tenn.

RATES OF FREIGHT.

	Between Augusta and Dalton, 271 miles.	Between Charleston, and Dalton, 408 miles.
1st class Boxes of Hats, Bonnets, and Furniture, per cubic foot	\$0 18	\$0 28
2d class Boxes and Bales of Dry Goods, Saddlery, Glass, Paints, Drugs, and Confectionary, per 100 lbs.	1 00	1 50
3d class Sugar, Coffee, Liquor, Bagging, Rope, Cotton, Yarns, Tobacco, Leather, Hides, Copper, Tin, Feathers, Sheet Iron, Hollow ware, Castings, Crockery, etc.	0 60	0 85
4th class Flour, Rice, Bacon, Pork, Beef, Fish, Lard, Tallow, Beeswax, Bar Iron, Ginseng, Mill Gearing, Pig Iron, and Grindstones, etc.	0 40	0 65
Cotton, per 100 lbs.	0 45	0 70
Molasses per hogshead	8 50	13 50
" " barrel	2 50	4 25
Salt per bushel	0 18	
Salt per Liverpool sack	0 65	
Ploughs, Corn Shellers, Cultivators, Straw Cutters, Wheelbarrows	0 75	1 50

German or other emigrants, in lots of 20 or more, will be carried over the above roads at 2 cents per mile.

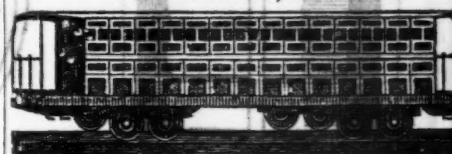
Goods consigned to S. C. Railroad Company will be forwarded free of commissions. Freight payable at Dalton.

F. C. ARMS,

44*1y

Sup't of Transportation.

**CAR MANUFACTORY
 CINCINNATI, OHIO.**



KECK & DAVENPORT would respectfully call the attention of Railroad Companies in the West and South to their establishment at Cincinnati. Their facilities for manufacturing are extensive, and the means of transportation to different points speedy and economical. They are prepared to execute to order, on short notice, Eight-Wheeled Passenger Cars of the most superior description. Open and Covered Freight Cars, Four or Eight-Wheel Crank and Lever Hand Cars, Trucks, Wheels and Axles, and Railroad Work generally.

Cincinnati, Ohio, Oct. 2, 1848.

44d

NICOLL'S PATENT SAFETY SWITCH FOR Railroad Turnouts. This invention for sometime in successful operation on one of the principal railroads in the country, effectually prevents engines and their trains from running off the track at a switch, left wrong by accident or design. It acts independently of the main track rails; being laid down or removed without cutting or displacing them.

It is never touched by passing trains, except when in use, preventing their running off the track. It is simple in its construction and operation, requiring only two castings and two rails; the latter, even if much worn or used, not objectionable.

Working models of the Safety Switch may be seen at Messrs. Davenport, Bridges & Kirk's Cambridge Port, Mass., and at the office of the Railroad Journal, New York.

Plans, Specifications, and all information obtained, on application to the Subscriber, Inventor and Patentee.
 G. A. NICOLLS,
 Reading, Pa.

FOWLER M. RAY'S METALLIC INDIA RUBBER CAR SPRINGS.

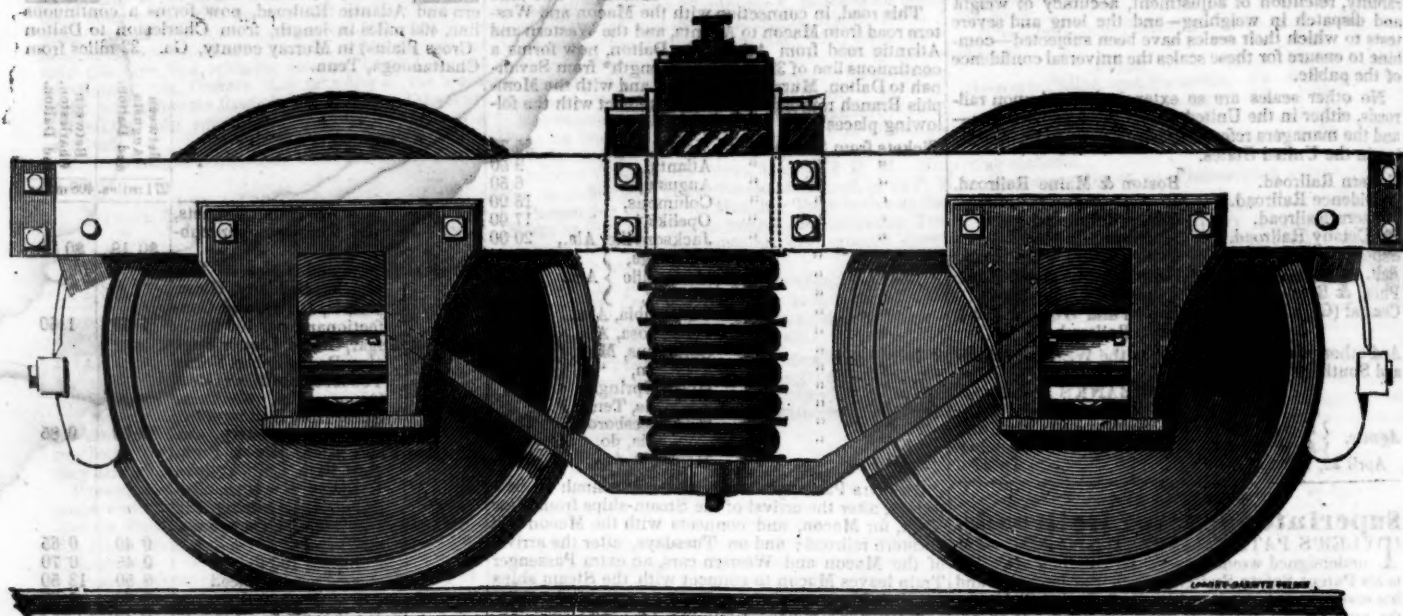


Fig. 1.

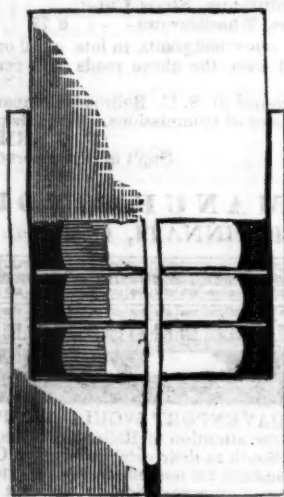


Fig. 2.

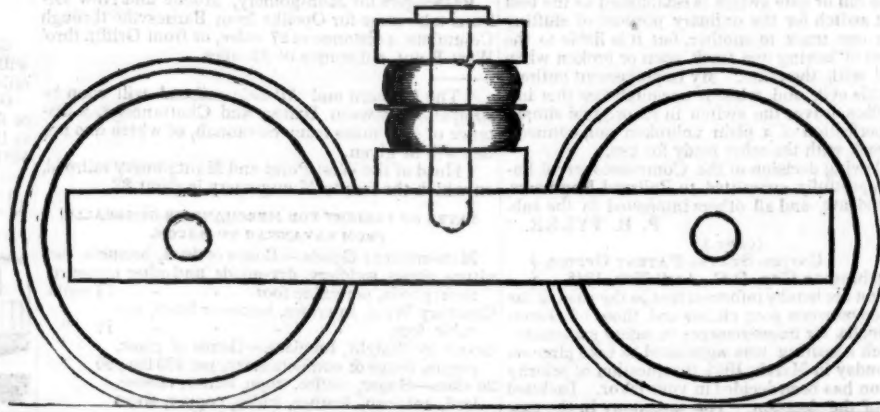


Fig. 3.

So much has been published for the purpose of misleading the public in regard to the inventorship of the India-rubber Railroad Spring, patented in the United States by Mr. W. C. Fuller, that the New England Car Company, proprietors of this invention, have deemed it proper, for the information of Railroad Companies, Car Builders and the public generally, to lay before them the facts upon which they found their claim to this invention, and to a Patent therefor.

Cut No. 1, Represents a cross section of the first model made by Mr. Tucker, under the direction of Mr. Ray, in the summer of 1844, and to which Mr. Tucker, Mr. Bradley and Mr. Bannister testify as being the model marked "B."

Cut No. 2, Represents the model made in 1845, to which Mr. Osgood Bradley and Gen. Thos. W. Harvey have testified.

Cut No. 3, Represents a rough sketch made by Mr. Ray in 1844, which he gave to a man about departing for England to take out some patents, who promised to write to Ray after his arrival in that country—which promise he has probably forgotten.

Mr. W. C. Fuller, of England, patented the above Spring in that country on the 23d October, 1845. He filed his enrollment April 23d, 1846, and on the 22d October, 1846, he took out a patent in the United States under the title, "For Improvement in Railway Carriages," when the improvement consisted in the spring, and not in the carriage.

The reader will perceive by the annexed testimony, that the India-rubber Railroad Car Spring was invented by Mr. Ray about two years previous to the date of Mr. Fuller's enrollment.

The Depositions are omitted for want of room, but will be published in full in the course of a few weeks.

AMERICAN RAILROAD JOURNAL.
PUBLISHED BY J. H. SCHULTZ & CO.
ROOM 12, THIRD FLOOR,
No. 136 Nassau Street,
NEW YORK.

TERMS.—Five Dollars a year, in advance.

RATES OF ADVERTISING.

One page per annum.....	\$200 00
One column ".....	75 00
One square ".....	20 00
One page per month.....	25 00
One column ".....	10 00
One square ".....	3 00
One page, single insertion.....	10 00
One column ".....	4 00
One square ".....	1 50
Professional Cards per annum.....	5 00

LETTERS and COMMUNICATIONS to this Journal may be directed to the Editor,
HENRY V. POOR,
136 NASSAU STREET.